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U.S. Environmental Protection Agency

Round 1 Long Term Groundwater Monitoring Report

Spickler Landfill Site
Spencer, Wisconsin

August 5, 1996

STS Consultants Ltd.
Consulting Engineers

August 5, 1996

United States Environmental Protection Agency
Region V
77 West Jackson Blvd.
Chicago, IL 60604

Attn: Mr. John Fagiolo
Remedial Project Manager

Re: Round 1 Long Term Groundwater Monitoring Report for the Spickler Landfill Site -- STS Project No. 84374XA

Dear Mr. Fagiolo:

On behalf of the Settling Defendants for the Spickler Landfill Site in Spencer, Wisconsin, STS Consultants, Ltd. (STS) is submitting the results of Round 1 of the Long Term Groundwater Monitoring. Round 1 of the Long Term Groundwater Monitoring was completed in accordance with the O&M Plan and QAPP. One copy of the complete data set has been provided under separate cover to the U.S. EPA.

As part of the long term monitoring program, wells S1A, S2A and S3A have been replaced at the same depths with S1AR, S2AR and S3AR. One overlapping round of groundwater quality data has been collected in both the older and replacement wells to ensure comparability of data trends as requested. Based on the data collected, we are formally requesting approval to abandon older wells S1A, S2A and S3A, since they are out of compliance with current State well installation regulations.

Respectfully submitted,

STS CONSULTANTS, LTD

Jane A. Kettler
Project Chemist

Jeanne M. Tarvin, P.G., CPG
Principal Hydrogeologist

Attachments

cc: See Distribution List

STS Consultants Ltd.
Consulting Engineers

11425 West Lake Park Drive
Milwaukee, Wisconsin 53224
414.359.3030/Fax 414.359.0822

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Report

PROJECT

LONG TERM GROUNDWATER
MONITORING, ROUND 1
MARCH, 1996
SPICKLER LANDFILL SITE

CLIENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604

Project No. 84374XA

Date AUGUST 5, 1996

STS Consultants, Ltd.
Consulting Engineers
11425 West Lake Park Drive
Milwaukee, Wisconsin 53224
414.359.3030/Fax 413.359.0822

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LONG TERM GROUNDWATER MONITORING
ROUND 1
SPICKLER LANDFILL SITE
MARCH, 1996

1.0 INTRODUCTION

On behalf of the Settling Defendants, STS Consultants, Ltd. (STS) has completed Round 1 of the Long Term Groundwater Monitoring for the Spickler Landfill Site. The monitoring was completed from March 12, 1996 to March 22, 1996. The Spickler Landfill Site is located in the northwest quarter of the southeast quarter of Section 33, Township 26N, Range 2E, Marathon County, Wisconsin. Figure 1 presents a Site Location Diagram.

The Long Term Groundwater Monitoring (LTGWM) includes sampling and analysis of groundwater monitoring and residential wells. The LTGWM Program is detailed in the final LTGWM Plan dated November 3, 1995. Protocols for sampling, sample handling and storage, sample chain-of-custody, laboratory and field analyses, and data evaluation are specified in the Spickler LTGWM Quality Assurance Project Plan (QAPP) dated November 3, 1995.

The objective of the LTGWM is to monitor groundwater at the landfill and nearby residences in order to evaluate the effectiveness of the remedy and to detect deterioration in groundwater quality. Deterioration, if any, in groundwater quality will be assessed by comparison of the LTGWM results to data collected prior to the remedial action and to action levels specified in the Wisconsin Administrative Code (WAC).

This Technical Memorandum presents the results of Round 1 of the LTGWM. Summary data tables are attached as Tables 1 through 5, and a copy of the complete data package as received from the analytical laboratory has been submitted to the U.S. EPA under separate cover. The analytical laboratory, Hazleton Environmental Services (HES), qualified the data as specified in the analytical methods included in the QAPP. Upon review of the analytical data, STS further qualified some of the data points, including some which appeared to reflect post-sampling contamination. The data qualification procedures were performed in accordance with the "National Functional Guidelines for Organic Data Review" and the "National Functional Guidelines for Inorganic Data Review," both documents dated February 1994.

2.0 FIELD SAMPLING PROCEDURES

2.1 Sample Collection

Groundwater samples were collected in accordance with the LTGWM Plan and QAPP. Samples were collected, preserved, and transported in accordance with the procedures outlined in the QAPP. Copies of the field sampling sheets documenting sample collection and field activities are attached in Appendix A.

The following monitoring and residential wells were sampled:

Monitoring Wells: MW-6S, MW-6D, MW-7S, MW-7D, MW-10S, MW-11S, MW-13S, MW-13D, MW-14S, MW-15S, MW-15D, MW-19S, MW-19D, MW-20S, MW-S1, MW-S1A, MW-S2, MW-S2A, MW-S3, MW-S3A, MW-S1AR, MW-S2AR, MW-S3AR

Residential Wells: RW-2543, RW-2551

Monitoring wells MW-S1AR, MW-S2AR, and MW-S3AR were installed in March 1996 to replace wells MW-S1A, MW-S2A, and MW-S3A which do not conform to the current well construction requirements in NR141, WAC. One overlapping round of data was collected in both the older existing wells and the replacement wells to ensure correlation of long term trends in water quality for these well locations. Upon regulatory agency concurrence, older, existing wells MW-S1A, MW-S2A, and MW-S3A will be abandoned in accordance with NR141, WAC. Installation of MW-S1AR, MW-S2AR, and MW-S3AR was discussed further in correspondence from STS to the U.S. EPA dated February 15, 1996; March 7, 1996; March 15, 1996; and Progress Report No. 32, dated June 7, 1996. Figure 2 presents a diagram of the site layout showing the residences and monitoring well locations.

Prior to sample collection at monitoring well locations, the depth to water was measured in the functioning wells, including those not sampled as part of the LTGWM. Data for depth to groundwater was used to determine the volume of water to be purged from each well and to calculate the groundwater elevation at each well. Field sampling personnel attempted to purge each well of four well volumes, although some wells purged dry. The volume of water purged from each well prior to sampling is included on field sampling sheets in Appendix A.

Data on groundwater elevations were compiled and compared to previously collected data to determine the current hydrogeologic conditions at the site. Groundwater elevations observed over the previous one year period are shown in Table 2. A groundwater contour map is presented as Figure 3, where a piezometric head distribution contour map is presented as Figure 4 for the March 1996 sampling round.

2.2 Sample Transportation

Samples were sent to HES in Madison, Wisconsin for analytical testing in accordance with the QAPP. Samples were placed on ice in coolers as they were collected. Samples were shipped by overnight carrier to HES. Included with the samples were Chain-of-Custody forms which were completed as the samples were collected. Copies of the completed Chain-of-Custody forms are included in Appendix B.

2.3 Field and Laboratory Analytical Procedures

2.3.1 Field Analyses

Groundwater samples were analyzed in the field for the following parameters in accordance with procedures outlined in the QAPP:

- Temperature
- pH
- Conductivity

Measurements were made as soon as possible after sample collection. Measurements of temperature were used to convert conductivity measurements to specific conductance at 25°C. The results of these measurements are included in Tables 1A, 1B and 1C.

2.3.2 Laboratory Analyses

Groundwater samples were analyzed by HES for the following parameters:

- Volatile Organic Compounds (VOCs) (naphthalene plus those VOCs associated with the Superfund Analytical Method for low concentration water).
- Metals (arsenic, barium, chromium, iron, lead, manganese, mercury and cyanide).
- Phthalates (di-n-butyl phthalate, bis-2-ethyl hexyl phthalate, di-ethyl phthalate.

Laboratory analytical procedures are discussed in the QAPP.

3.0 RESULTS OF FIELD AND LABORATORY ANALYTICAL DATA

The results of the field and laboratory analytical data have been compiled into two categories: monitoring wells and residential wells. NR140, Wisconsin Administrative Code (WAC) standards will be used throughout the LTGWM to assess the quality of groundwater sampled from the monitoring wells and residential wells. Groundwater quality trends have been preliminarily evaluated by comparing the December 1993 sampling round to the March 1996 sampling round. A detailed analysis, however, will be performed after an additional round of data is collected. Site specific background water quality data is not available for comparison. Previous attempts by the settling defendents to obtain permission to install upgradient, background wells off-site have been unsuccessful.

3.1 Results of Field Analytical Data

3.1.1 Monitoring Wells

The field analytical data collected from the monitoring wells during Round 1 of the LTGWM are presented in Table 2A.

From the December 1993 to the March 1996 sampling round, seven wells had changes in pH which were greater than 0.5 units. At five of the seven wells, pH increased toward a more neutral pH. Well MW-13D had a pH increase of 1.2 units. Wells MW-11S and MW-S2A had decreases in pH. During the interim monitoring, pH at these and other wells had typically varied by less than 0.5 units from one sampling round to the next.

Changes of greater than 20% in conductivity were observed at 10 wells. In the cases of wells MW-6D, MW-7D, MW-13D, and MW-15D the change may be due to errors in recording the conductivity values in December, 1993 since the December 1993 readings were approximately one tenth of the September 1993 and March 1996 readings. Conductivity in the other 6 wells (MW-11S, MW-19S, MW-S1, MW-S2, MW-S2A, and MW-S3) has decreased over the course of the last 3 sampling rounds. Conductivity is generally proportional to total dissolved solids content.

3.1.2 Residential Wells

Results of the field analyses of residential well samples are presented in Table 2B. The March 1996 pH value at RW-2543 was 0.6 units lower than that observed in December 1993, whereas, the conductivity value was 24% lower than that observed in December, 1993. March 1996 pH and conductivity at RW-2551 were consistent with the December 1993 data.

3.2 Results of Laboratory Analytical Data

Laboratory analyses were performed for metals and cyanide, VOCs and three phthalates. Results for inorganics are presented on Tables 3A and 3B. Results for VOCs are presented on Tables 4A, and 4B. Results for phthalates are presented on Tables 5A and 5B. The first columns of each table present the NR140 WAC Enforcement Standards (ESs), NR140, WAC Preventive Action Limits (PALs), method detection limits and reporting limits for each compound.

The analytical results have been qualified by HES and/or STS. Definitions for the data qualifiers used are listed at the foot of each table. The laboratory analytical results observed for monitoring wells and residential wells are discussed below.

3.2.1 Monitoring Wells

Analytical results for monitoring wells are presented in Tables 3A, 4A, and 5A.

VOCs - The results of analysis of the monitoring well samples show nine ES exceedances and 21 PAL exceedances. ES and PAL exceedances for VOCs in samples from monitoring wells were as follows:

ES Exceedances

Parameters	Sample ID
Vinyl Chloride	MW-6S, MW-10S, MW-13S, MW-S1A, MW-S1AR MW-S2A, MW-S3, MW-S3A, MW-S3AR

(Additional ES exceedances were observed for methylene chloride in a field blank and a trip blank.)

PAL Exceedances

Parameters	Sample ID
1,2-dichloroethane	MW-6S, MW-S3A, MW-S3AR
Benzene	MW-6S, MW-10S, MW-11S, MW-13S, MW-20S, MW-S1A, MW-S1AR, MW-S2A MW-S3, MW-S3A, MW-S3AR
Chloroform	MW-S1AR
Cis-1,2-dichloroethene	MW-S1AR
Trichloroethene	MW-6S, MW-S1AR, MW-S1A
Vinyl chloride	MW-20S
Bromodichloromethane	MW-S3AR

(Additional PAL exceedances were observed for chloromethane in 2 trip blanks and 1 field blank; and methylene chloride in one trip blank, 4 method blanks, and 2 storage blanks.)

The March 1996 data differ from the Interim Monitoring data (collected prior to the remedy construction) in that March 1996 total xylene, ethylbenzene, and toluene concentrations were lower in several of the samples. The most significant decreases were for xylene in samples MW-6S, MW-13S, MW-S2, MW-S2A, and MW-S3. Total xylene concentrations in MW-13S, MW-S2, MW-S2A, and MW-S3 ranged form 270 to 770 μg/L in December 1993 but ranged from only 6 to 100 μg/L in March 1996.

More vinyl chloride NR140 exceedances were observed in March 1996 than in December 1993, including ES exceedances for vinyl chloride in samples from MW-13S and MW-S2A, and a PAL exceedance for vinyl chloride in sample MW-20S. But since the March 1996 vinyl chloride concentrations were less than 1 they were not, therefore, significantly different from the December 1993 concentrations for the same wells which were reported as not detected above the contract required quantitation limit (CRQL) of 1.

Metals - ES exceedances for iron and manganese were observed for samples MW-6S, MW-10S, MW-11S, MW-13S, MW-19S, MW-S1A, MW-S1AR, MW-S2, MW-S2A, MW-S3, and MW-S3AR. ES exceedances for manganese only were observed for MW-19D and MW-S3A. PAL exceedances for metals were as follows:

Parameters	Sample ID
Arsenic	MW-15S
Barium	MW-11S, MW-13S, MW-S1AR, MW-S2
Iron	MW-7D

No PAL or ES exceedances were observed for cyanide. Cyanide was detected in several samples, but the levels were comparable to what was detected in a field blank so the sample concentrations were qualified with a "u". The highest cyanide concentration detected was approximately 10 times less than the PAL of 40 μg/L.

With the exception of iron concentrations in MW-S2 and MW-S2A, March 1996 metal concentrations were similar to the metal concentration observed prior to the remedial construction. March 1996 iron concentrations in MW-S2 and MW-S2A were 15% and 5% respectively of the December 1993 iron concentrations for the same wells. The conductivity measurements for these two wells also dropped by 30 to 50%. Both of these wells also showed significant changes in total xylene concentrations.

Since changes in metal concentrations may be attributable to changes in atmospheric pressure and local groundwater infiltration rates, the data will continue to be evaluated for stable trends in metal concentrations.

Cyanide was not detected above the NR140 PAL in any of the LTGWM Round 1 samples. The March 1996 cyanide samples were treated with sulfamic acid to remove potential interferences from other nitrogen compounds. Although cyanide was detected in several of the March 1996 samples, the values were very low and were comparable to those detected in field or method blanks and so the data were qualified with a "u". Similarly many of the cyanide concentrations reported during the Interim Monitoring were qualified with a "u". Reported cyanide values for March 1996 samples were lower than the December 1993 samples in all samples except MW-15S. Since cyanide results were lower in samples treated with sulfamic acid, and cyanide has not been detected above the PAL, we propose dropping cyanide from the list of groundwater monitoring parameters.

Phthalates

Phthalates were detected in several samples, but were also detected in field and method blanks. In most cases, the phthalate concentrations in samples were comparable to those detected in field or method blanks, so the sample concentrations were qualified with a "u". At this time, groundwater quality standards exist only for bis (2-ethylhexyl) phthalate. The WDNR is planning, however, to evaluate di-n-butyl phthalate and diethyl phthalate for possible inclusion on the NR140 list in 1996 or 1997.

One ES exceedance of bis (2-ethylhexyl) phthalate was observed in sample MW-S3AR and PAL exceedances of bis (2-ethylhexyl) phthalate were observed in four method blanks. Since detection of phthalates has been shown in all recent sampling rounds to be related to post-sampling contamination, we propose dropping phthalates from the list of groundwater monitoring parameters.

3.2.2 Residential Wells

The results of the laboratory analyses of the residential well samples are presented in Tables 3B, 4B, and 5B. No PAL or ES exceedances were observed for VOCs, metals, cyanide, or phthalates. Results were comparable to those observed previously.

3.3 Conclusions

Round 1 of the LTGWM was conducted 27 months after completion of four quarters of Interim Monitoring conducted from March 1993 to December 1993. During that 27 month period, leachate and gas removal systems were installed within the fill areas, and an engineered cover was placed over the fill areas.

The purpose of the Interim Monitoring was to provide a data base against which post-remedial groundwater data could be compared. One purpose of the LTGWM is to provide post-

remedial data to be used to evaluate the effect of the leachate and gas removal systems on groundwater quality. Since only one round of post-remedial groundwater quality data is available, no conclusions regarding trends or changes in groundwater quality will be made at this time. The results of Round 1 of the LTGWM did, however, differ from the Interim Monitoring data as follows:

- Post-remedial concentrations of xylenes decreased as much as one to two orders of magnitude in samples from MW-13S, MW-S2, MW-S2A, and MW-S3. Each of these wells is downgradient of and within approximately 120 feet of the old fill area.
- Iron concentrations in samples from MW-S2 and MW-S2A decreased by approximately one order of magnitude.
- Specific conductance in samples from MW-11S, MW-19S, MW-S1, MW-S2, MW-S2A, and MW-S3 has decreased over the past three sampling rounds. Each of these wells is within approximately 90 feet of one of the fill areas.

The results of the Round 1 LTGWM were consistent with the Interim Monitoring data in the following respects:

- Phthalates, though detected in many groundwater samples, were also present at approximately the same concentrations in the field and method blanks. As a result, nearly all phthalate data points have been qualified with a "u" meaning "not detected above the concentration shown." Phthalates do not appear to be a site contaminant and continued analysis for phthalates will not provide useful, representative data.
- Cyanide was detected in several samples, as it had been in the Interim Monitoring. Sample concentrations were similar to those seen in field blanks, and were, in accordance with the data validation guidelines, qualified with a "u". The cyanide concentrations were slightly lower than those detected during the Interim Monitoring, possibly due to pre-treatment of samples to remove interferences. Continued analysis for cyanide is not necessary given it does not appear to be a site contaminant.
- Naphthalene was added to the list of target VOCs for a minimum of one round of the LTGWM. Naphthalene was included on the list of target compounds for Round 1 of the Interim Monitoring, but was dropped from the list of compounds for Interim Monitoring Rounds 2,3, and 4 because it was detected in few samples and at very low levels.

  The highest concentration of naphthalene detected during Round 1 of the LTGWM was a concentration of 3 μg/L in a method blank. Other method blanks also contained naphthalene, but at lower concentrations. Naphthalene was detected at concentrations of less than 1 μg/L in several samples, but the values were qualified

with a "u" since similar or higher naphthalene levels in method blanks suggested a laboratory-borne contaminant source. Continued monitoring for naphthalene is not necessary since it does not appear to be a site contaminant.

3.4 Recommendations

Based on the observations noted above, STS makes the following recommendations for subsequent rounds of the LTGWM:

- Eliminate testing for phthalates, naphthalene, and cyanide since data acquired to date does not indicate that groundwater has been affected by phthalates, naphthalene, or cyanide.

4.0 QUALITY ASSURANCE REVIEW OF ANALYTICAL DATA

4.1 Field Data

The pH and conductivity meters were calibrated daily. Relative percent error (RPE) was determined by analysis of a check standard after every 10 or fewer samples, and Relative Percent Difference (RPD) was determined by analysis of a duplicate sample with every 10 or fewer samples. RPE for pH standards should be within 0.1 units of the true value and results of duplicate analysis for pH should agree within 0.2 units. The RPE of conductivity standards should be within 10 percent of the true value and the RPD of duplicate analysis of samples for conductivity should be within 15 percent. QA measurements for conductivity consistently fell within the control limits specified above.

QA measurements for pH exceeded the QC limit in one case. On March 12, 1996, the pH RPE for the 7.00 standard taken at the end of the day was 0.16 unit which exceeds the control limit of 0.1 unit. Samples MW-6S, MW-19D, MW-19S, MW-19S (Dupe) and MW-FB01 were analyzed before the QC exceedance and the pH data may, therefore, be suspect. Analysis of check standards throughout the remainder of the sampling event fell within the RPE limit of 0.1 unit. The RPE for duplicate analyses for pH consistently fell within the limit of 0.2 unit.

4.2 Laboratory Data

The analytical work for Round 1 of the LTGWM was completed in accordance with the QAPP. Methods of sample preservation and holding times are specified in the QAPP. Laboratory analytical methods, laboratory QA measurements and acceptance criteria for the QA measurements are specified in the QAPP or the associated Standard Operating Procedures (SOP) cited in the QAPP.

A brief case narrative was submitted by HES which discusses adherence of laboratory procedures and QA measurements to the standards specified in the QAPP. A copy of the HES narrative is provided as Appendix C to this technical memo. The following is a summary of the information presented in the HES narrative along with observations made during the QA evaluation performed by STS.

4.2.1 Sample Handling and Analytical Methods

The samples were preserved, secured, and analyzed in accordance with the QAPP. Copies of the completed chain-of-custody forms documenting sample collection, identification, preservation, and condition upon receipt are included in Appendix B to this technical memorandum.

The samples for VOCs, metals and cyanide were analyzed within the holding times specified in the QAPP. All SVOC samples except one of two duplicate samples from MW-13S were analyzed within the holding time for SVOCs. Sample MW-13S-Dupe was re-extracted and analyzed outside the holding time due to non-compliant surrogate recovery during the first analysis. Holding times were calculated from the date of sample receipt at the laboratory.

4.2.2 Blanks

Method and storage blanks were analyzed at the frequency specified in the analytical procedures. The storage blanks (used for VOCs only) contained methylene chloride, toluene, xylenes, and naphthalene. Methylene chloride concentrations in both storage blanks exceeded the PAL.

One or more VOC method blanks contained detectable levels of 1,2-dichlorobenzene, 2-hexanone, 4-methyl-2-pentanone, methylene chloride, toluene, xylene, and naphthalene. One or more method blanks for SVOCs contained bis (2-ethyl hexyl) phthalate, di-n-butylphthalate, and di ethyl phthalate. Method blanks for metals contained arsenic, iron, manganese and mercury. Concentrations of target analytes detected in the method blanks were within the control limits specified in the QAPP and in the analytical procedures. Analyte concentrations detected in samples at concentrations less than 5 times the concentrations in method blanks or storage blanks are flagged with a "u" to indicate that the data is likely not representative of site conditions.

Field and trip blanks were prepared at the frequency and according to the procedures specified in the QAPP. The field blanks monitor for contamination introduced during or after the sampling procedure. The trip blanks monitor for contamination introduced to VOC samples during container shipment from the laboratory and sample shipment to the laboratory. Results of field and trip blanks are shown on the attached tables. In accordance with the National Functional Guidelines, analyte concentrations detected in samples at concentrations less than five times those detected in trip or field blanks are flagged with a "u" to indicate that the data is likely not representative of actual site conditions. In accordance with these guidelines, all cyanide values, all but one bis (2-ethyl hexyl) phthalate value, all di-n-butyl phthalate values, and many VOC values have been qualified with a "u".

4.2.3 Surrogate and Matrix Spike Recoveries

Surrogates are added to each of the samples to be analyzed for VOCs to monitor for purging efficiency. Surrogate recoveries for VOCs were within the control limits for each of the samples, method blanks, and matrix spike samples analyzed.

Matrix spiking solutions are added to one of every twenty samples to be analyzed for VOCs or metals to monitor for matrix interference. Matrix spikes for VOCs were prepared in

duplicate. Spike recoveries and reproducibility were evaluated for 1,1-dichloroethene, trichloroethene, benzene, toluene, and chlorobenzene. Both the individual spike recoveries and the relative percent difference (RPD) of the duplicates were calculated and compared to control limits. High (or low) spike recoveries indicate a possible high (or low) bias in the reported values of these and similar compounds detected in the samples. The RPD is a measure of precision or reproducibility. All spiking compounds were recovered within the control limits. The RPD for each of the five spiking compounds and for each VOC MS/MSD pair were within control limits.

Surrogates are not used in the metals analyses and matrix spikes are added only once rather than in duplicate. The matrix spike for metals is added to one of every twenty samples. A matrix spiking solution consisting of arsenic, barium, cadmium, chromium, iron, lead, manganese, mercury, and cyanide was added to three samples. Matrix spike recoveries were within control limits.

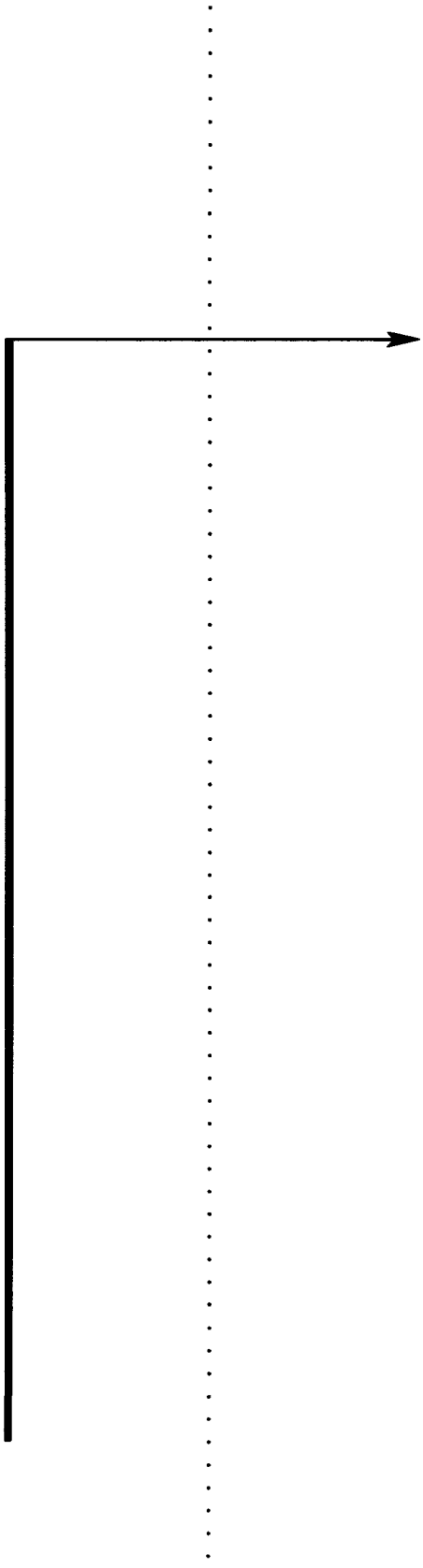
In addition to the matrix spikes, post-digestion spikes were used for metals analyzed by graphite furnace methods (arsenic and lead). Post-digestion spike recovery for lead exceeded the upper control limit of 115% for samples MW-10S, and MW-S2. Post-digestion spike recoveries for the remaining samples and parameters were within control limits.

High matrix spike recoveries indicate a possible high bias in the reported results. Lead was not detected above the detection limit of 1 μg/L in either of the two groundwater samples with high spike recovery. The high spike recoveries are not believed, therefore, to significantly affect the data quality.

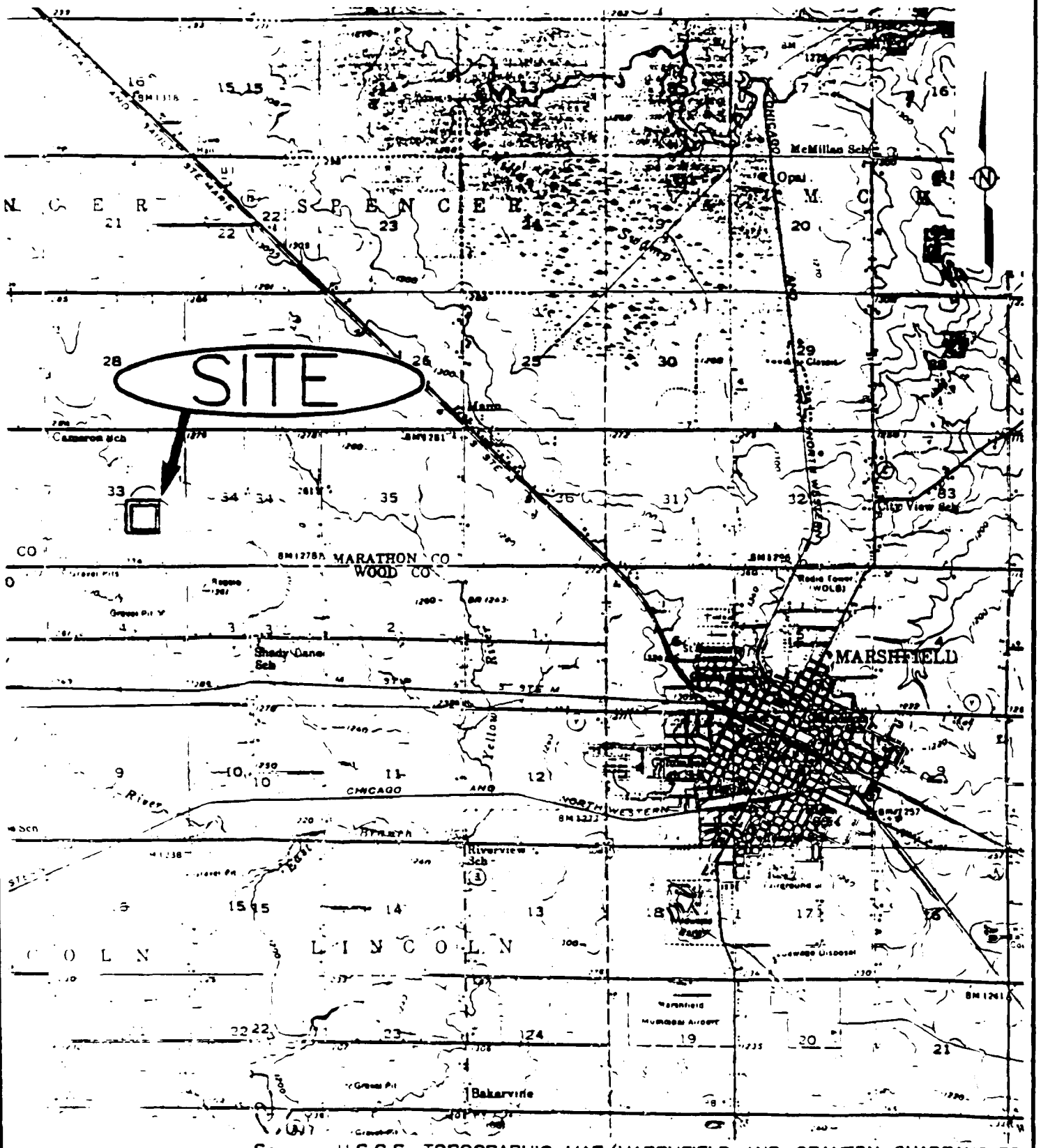
4.2.4 Quality Assurance Summary

The laboratory analytical data is generally considered to be complete and meets the QA/QC criteria established in the QAPP. An attempt has been made, through application of the Guidelines for Data Validation, to identify non-representative data resulting from post-sampling contamination. The affected sample results have been appropriately qualified. Data which may reflect a bias based upon high or low spike recovery have also been appropriately qualified.

FIGURES



LIST OF FIGURES



Source: U.S.G.S. TOPOGRAPHIC MAP/MARSHFIELD AND GRANTON QUADRANGLES

STS Consultants, Ltd.

PROJECT/CLIENT

SITE LOCATION MAP
REMEDIAL DESIGN PROJECT
SPICKLER LANDFILL
TOWN OF SPENCER
MARATHON COUNTY, WISCONSIN

DRAWN BY	C.R.H.	10/28/92
CHECKED BY	L.K.S.	10/28/92
APPROVED BY	T.W.K.	10/28/92
SCALE 1" =5280'	FIGURE NO. 1	
CADFILE 894-1LR1	STS PROJECT NO. 83894XF	
PLOT DATE 10-28-92		

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DOC ID #	**150820**		
DESCRIPTION OF ITEM(S)	**OVERSIZE SITE MAPS**		
REASON WHY UNSCANNABLE	**__X__ OVERSIZED**	**OR**	**___ FORMAT**
DATE OF ITEM(S)			
NO. OF ITEMS	**2**		
PHASE	**SAS**		
PRP			
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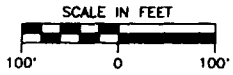
O.U.			
LOCATION	**Box # _____ Folder # ___ Subsection _____**		
COMMENT(S)			
PARTIAL COPY OF OVERSIZED SITE MAPS			

NOTE:

1. GROUNDWATER ELEVATIONS TAKEN JUNE 13, 1996
2. TOPOGRAPHIC BASE MAP PREPARED FROM AERIAL SURVEY PERFORMED BY KBM, INC. GRAND FORKS, SOUTH DAKOTA FOR WARZYN ENGINEERING INC., FROM PHOTOGRAPHY DATED APRIL 11, 1988. TOPOGRAPHIC BASE MAP OF LANDFILL SHOWS AS-BUILT FINISH GRADES DATED OCTOBER 14, 1994.



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Consulting Engineers

STS PROJECT NUMBER	84374XA
STS DRAWING NUMBER	84374XA-1
SCALE	AS SHOWN
SHEET NUMBER	3

NOTE:

1. GROUNDWATER ELEVATIONS TAKEN JUNE 13, 1996
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SCALE IN FEET

100' 0 100'

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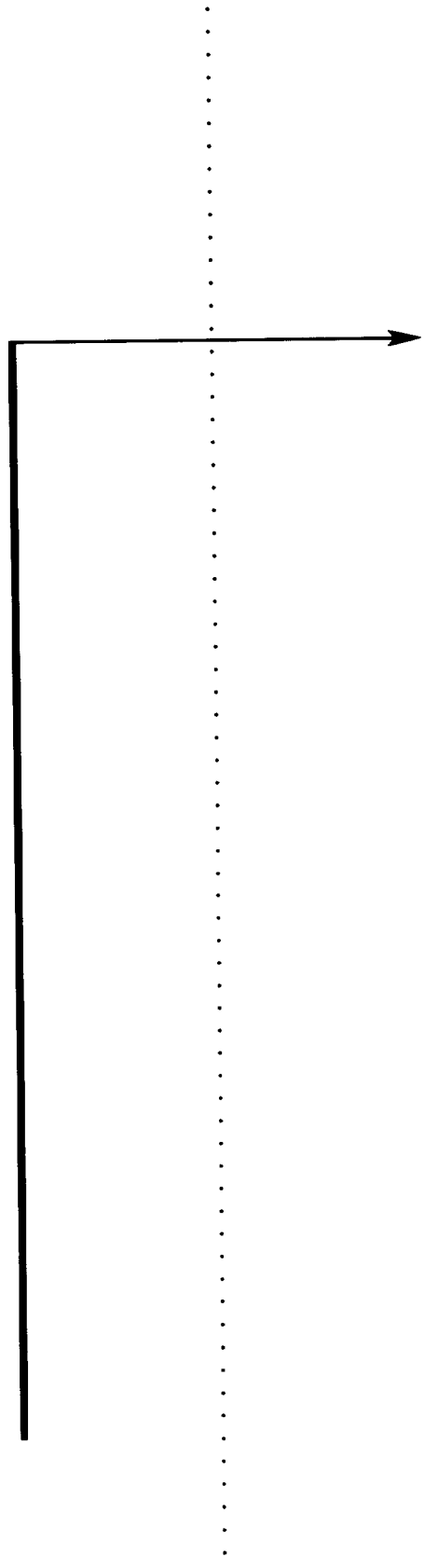
STS PROJECT NUMBER	84374XA
STS DRAWING NUMBER	84374XA-4
SCALE	AS SHOWN
SHEET NUMBER	4

TABLES



LIST OF TABLES

Table 1
Groundwater Elevation Summary
Spickler Monitoring
STS Project No. 84374XA

Well No.	TPVC Pipe Elev	Ground Surface Elevation	Depth of Well	Date: 02/15/95 Depth Water	Date: 02/15/95 Elev. Water	Date: 3/30/95 Depth Water	Date: 3/30/95 Elev. Water	Date: 4/25/95 Depth Water	Date: 4/25/95 Elev. Water	Date: 6/5/95 Depth Water	Date: 6/5/95 Elev. Water	Date: 9/8/95 Depth Water	Date: 9/8/95 Elev. Water	Date: 9/15/95 Depth Water	Date: 9/15/95 Elev. Water	Date: 12/15/95 Depth Water	Date: 12/15/95 Elev. Water	Date: 3/11/96 Depth Water	Date: 3/11/96 Elev. Water
MW-6D	1307.24	1305.11	62.7	19.60	1287.64	18.36	1288.88	---	---	18.27	1288.97	---	---	19.47	1287.77	18.55	1288.69	18.32	1288.92
MW-6S	1307.23	1304.98	20.1	13.87	1293.36	13.37	1293.86	---	---	12.73	1294.50	---	---	14.02	1293.21	13.16	1294.07	13.88	1293.35
MW-7D	1319.42	1317.09	62.7	30.24	1289.18	29.57	1289.85	---	---	28.85	1290.57	---	---	30.41	1289.01	29.61	1289.81	29.28	1290.14
MW-7S	1319.82	1317.34	24.1	21.29	1298.53	19.15	1300.67	---	---	20.34	1299.48	---	---	23.29	1296.53	20.30	1299.52	20.16	1299.66
MW-8D	1332.27	1329.87	47.6	33.20	1299.07	31.88	1300.39	---	---	29.87	1302.40	---	---	31.97	1300.30	32.44	1299.83	32.82	1299.45
MW-8S	1332.29	1329.86	22.5	14.80	1317.49	8.80	1323.49	---	---	11.22	1321.07	---	---	12.52	1319.77	11.85	1320.44	12.12	1320.17
MW-9S	1311.65	1309.33	28.6	17.93	1293.72	17.50	1294.15	---	---	16.77	1294.88	---	---	18.06	1293.59	17.39	1294.26	16.70	1294.95
MW-10D	1324.29	1322.25	62.6	33.25	1291.04	32.65	1291.64	---	---	32.40	1291.89	---	---	33.90	1290.39	33.05	1291.24	32.99	1291.30
MW-10S	1324.55	1322.48	20.8	8.79	1315.76	4.13	1320.42	---	---	6.92	1317.63	---	---	6.76	1317.79	5.84	1318.71	6.78	1317.77
MW-11S	1329.58	1327.21	20.6	18.60	1310.98	4.44	1325.14	---	---	6.40	1323.18	---	---	8.48	1321.10	8.18	1321.40	8.08	1321.50
MW-12D	1304.94	1302.71	62.5	21.09	1283.85	19.43	1285.51	---	---	19.49	1285.45	---	---	20.82	1284.12	19.81	1285.13	19.43	1285.51
MW-12S	1305.02	1302.74	27.8	14.82	1290.20	12.35	1292.67	---	---	12.92	1292.10	---	---	14.42	1290.60	13.52	1291.50	12.54	1292.48
MW-13D	1305.7	1303.40	62.8	17.65	1288.05	16.53	1289.17	---	---	16.32	1289.38	---	---	17.48	1288.22	16.70	1289.00	16.42	1289.28
MW-13S	1306.08	1303.69	23.6	12.40	1293.68	12.00	1294.08	---	---	11.33	1294.75	---	---	12.57	1293.51	11.85	1294.23	11.48	1294.60
MW-14D	1306.77	1304.74	62.4	18.30	1288.47	17.30	1289.47	---	---	17.07	1289.70	---	---	18.15	1288.62	17.35	1289.42	17.29	1289.48
MW-14S	1306.57	1304.35	26.3	12.45	1294.12	12.15	1294.42	---	---	11.44	1295.13	---	---	12.67	1293.90	12.08	1294.49	11.71	1294.86
MW-15D	1310.82	1305.67	72.6	21.45	1289.37	20.63	1290.19	---	---	20.35	1290.47	---	---	21.31	1289.51	20.70	1290.12	20.54	1290.28
MW-15S	1310.29	1307.95	27.4	14.61	1295.68	14.57	1295.72	---	---	13.85	1296.44	---	---	14.94	1295.35	14.41	1295.88	14.28	1296.01
MW-16S	1323.74	1321.52	20.9	7.80	1315.94	3.12	1320.62	---	---	5.21	1318.53	---	---	6.54	1317.20	5.17	1318.57	5.28	1318.46
MW-17SR	1341.52	1338.90	18.7	16.40	1325.12	14.50	1327.02	---	---	14.85	1326.67	14.78	1326.74	14.95	1326.57	15.75	1325.77	15.28	1326.24
MW-18S	1315.05	1312.89	26.3	14.03	1301.02	14.07	1300.98	---	---	13.32	1301.73	---	---	14.70	1300.35	14.22	1300.83	14.40	1300.65
MW-19D	1334.22	1331.83	52.2	35.00	1299.22	35.73	1298.49	---	---	34.60	1299.62	---	---	35.58	1298.64	35.54	1298.68	35.98	1298.24
MW-19S	1334.34	1332.06	21.1	8.65	1325.69	7.30	1327.04	---	---	6.93	1327.41	---	---	6.95	1327.39	7.18	1327.16	8.01	1326.33
MW-20S	1298.93	1297.01	21.8	6.63	1292.30	5.65	1293.28	---	---	5.49	1293.44	---	---	6.76	1292.17	5.90	1293.03	5.43	1293.50
S1	1331.86	1331.86	21.15	19.11	1312.75	18.80	1313.06	---	---	18.41	1313.45	---	---	18.34	1313.52	--	--	17.20	1314.66
S1A	1331.90	1331.90	49.15	34.00	1297.90	35.75	1296.15	---	---	34.04	1297.86	---	---	34.84	1297.06	--	--	34.25	1297.65
S1AR	1335.41	1332.48	41.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	37.54	1297.87
S2	1311.87	1311.90	12	NA	NA	6.05	1305.82	---	---	4.95	1306.92	---	---	5.48	1306.39	--	--	5.76	1306.11
S2A	1311.81	1311.80	24.4	NA	NA	15.00	1296.81	---	---	14.76	1297.05	---	---	15.05	1296.76	--	--	16.14	1295.67
S2AR	1314.93	1312.37	30.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18.99	1295.94
S3	1313.28	1310.10	20.31	17.46	1295.82	17.18	1296.10	---	---	16.07	1297.21	---	---	18.22	1295.06	16.65	1296.63	15.78	1297.50
S3A	1312.71	1310.18	33.9	18.60	1294.11	18.20	1294.51	---	---	17.56	1295.15	---	---	18.82	1293.89	17.95	1294.76	17.80	1294.91
S3AR	1311.76	1308.89	32.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16.62	1295.14
LH-1	1326.76	1324.08	7.1	Dry	Dry	Dry	Dry	6.22	1320.54	6.10	1320.66	6.22	1320.54	6.26	1320.50	--	--	6.74	1320.02
LH-4	1326.99	1325.13	14	13.05	1313.94	13.24	1313.75	13.36	1313.63	13.29	1313.70	13.26	1313.73	13.28	1313.71	--	--	Damage	--
LH-6	1347.35	1344.27	7.72	16.00	1331.35	16.10	1331.25	15.99	1331.36	15.93	1331.42	15.72	1331.63	15.77	1331.58	15.90	1331.45	16.05	1331.30
LH-8	1344.61	1341.74	21.2	18.50	1326.11	17.73	1326.88	17.64	1326.97	17.85	1326.76	17.54	1327.07	17.40	1327.21	18.00	1326.61	17.86	1326.75
LH-9	1334.65	1330.70	11.5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Sump#2	1328.08	---	---	---	---	---	---	13.50	1314.58							--	--	--	--
Sump#3	1341.46	---	---	---	---	---	---	8.02	1333.44							--	--	--	--

Notes:

1. Elevations are in feet relative to Mean Sea Level and depths are in feet.
2. NA = Data not available or well not present at that time.
3. Top of PVC and Ground Surface Elevations were obtained on February 15, 1995.
4. --- = Groundwater Elevations not measured.

TABLE 2A
FIELD PARAMETERS
GROUNDWATER MONITORING WELLS
ROUND 1 LONG TERM GROUNDWATER MONITORING
SPICKLER LANDFILL SITE

PARAMETER	MW-6S	MW-6D	MW-6D (dupe)	MW-7S	MW-7D	MW-10S	MW-11S	MW-13S	MW-13S (dupe)	MW-13D
pH (standard units)	5.40	5.61	5.70	5.12	5.87	5.93	5.98	6.19	6.21	6.57
Temperature (degrees Celsius)	8.9	8.1	8.9	11.0	10.3	9.0	6.0	9.9	9.9	9.1
Specific Conductance (umhos/cm)	220	42	43	190	41	613	1500	327	325	43

Notes:

1. Samples were collected in March 1996

TABLE 2A
FIELD PARAMETERS
GROUNDWATER MONITORING WELLS
ROUND 1 LONG TERM GROUNDWATER MONITORING
SPICKLER LANDFILL SITE

PARAMETER	MW-14S	MW-15S	MW-15D	MW-19S	MW-19S (dupe)	MW-19D	MW-20S	MW-S1	MW-S1A	MW-S1AR
pH (standard units)	6.19	6.26	6.60	6.13	6.17	5.48	6.05	6.72	6.65	6.62
Temperature (degrees Celsius)	7.9	7.0	10.0	11.0	11.0	11.0	6.1	6.1	7.3	7.5
Specific Conductance (umhos/cm)	106	155	33	861	833	74	191	307	1254	3246

Notes:

1. Samples were collected in March 1996

TABLE 2A
FIELD PARAMETERS
GROUNDWATER MONITORING WELLS
ROUND 1 LONG TERM GROUNDWATER MONITORING
SPICKLER LANDFILL SITE

PARAMETER	MW-S2	MW-S2A	MW-S2AR	MW-S3	MW-S3A	MW-S3A (dupe)	MW-S3AR
pH (standard units)	6.27	5.90	5.83	6.09	5.53	5.50	6.10
Temperature (degrees Celsius)	6.1	8.0	8.1	6.1	8.0	8.5	6.1
Specific Conductance (umhos/cm)	368	426	301	368	514	507	449

Notes:

1. Samples were collected in March 1996

TABLE 2B
FIELD PARAMETERS
RESIDENTIAL WELLS
ROUND 1 LONG TERM GROUNDWATER
MONITORING
SPICKLER LANDFILL SITE

PARAMETER	RW-2543	RW-2543 (dupe)	RW-2551
pH (standard units)	5.93	5.99	6.06
Temperature (degrees Celsius)	10.1	10.1	10.3
Specific Conductance (umhos/cm)	87	86	119

Notes:

1. Samples were collected in March 1996

Table 3A
Metal and Cyanide Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte, µg/l	IDL	CRDL	NR140 PAL	NR140 ES	MW-6D	MW-6S	MW-7D	MW-7S	MW-10S	MW-11S	MW-13D	MW-13S
Arsenic	1.0	10.0	5	50	1 U	2.9 B	1.0 U	1.0 U	1.0 U	1.6 B	1 U	1 U
Barium	0.6	200	400	2000	1.5 U	93.1 U	1.1 U	52.0 U	230	**482**	2.5 U	**433**
Chromium	3.6	10	10	100	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Cyanide	2.5	10	40	200	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.7 U
Iron	6.6	100	150	300	6.6 U	**5090**	**155**	19.9 U	**12700**	**41300**	6.6 U	**3280**
Lead	1.0	3.0	1.5	15	1 U	1 U	1.0 U	1.0 U	1.0 U W2	1 U	1 U	1 U
Manganese	0.3	15	25	50	3.8 U	**1320**	24.0	12.8 U	**798**	**2970**	4.3 U	**5960**
Mercury	0.03	0.2	0.2	2	0.03 U	0.03 U	0.10 U	0.17 U	0.20 U	0.04 U	0.12U	0.05 U

Notes:
Samples collected in March 1996
Units in µg/L
U = analyte not detected above concentration shown
B = analyte detected, but below contract required detection limit
CRQL - Contract Required Detection Limit
IDL - Instrument Detection Limit
W2 - Post digestion spike recovery exceeded upper control limit.
ES Exceedance -
PAL Exceedance -
* MW-S1 did not contain sufficient water to sample for metals and cyanide.

Table 3A
Metal and Cyanide Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte, µg/l	IDL	CRDL	NR140 PAL	NR140 ES	MW-13S (Dupe)	MW-14S	MW-15D	MW-15S	MW-19D	MW-19S	MW-19S (Dupe)	MW-20S
Arsenic	1.0	10.0	5	50	1 U	1 U	1 U	**28.8**	1 U	3.5 B	3.2 B	1 U
Barium	0.6	200	400	2000	**464**	47.1 U	3.9 U	50.2 U	45.3 U	243	235	55.4 U
Chromium	3.6	10	10	100	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Cyanide	2.5	10	40	200	2.5 U	2.5 U	2.5 U	4.3 U	2.7 U	3.3 U	2.5 U	2.8 U
Iron	6.6	100	150	300	**3940**	6.6 U	6.6 U	6.6 U	125	**25600**	**25400**	6.6 U
Lead	1.0	3.0	1.5	15	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Manganese	0.3	15	25	50	**6490**	6 U	5.3 U	15.4 U	**142**	**1070**	**1060**	12.7 U
Mercury	0.03	0.2	0.2	2	0.13 U	0.15 U	0.03 U	0.07 U	0.03 U	0.03 U	0.03 U	0.03 U

Notes:
Samples collected in March 1996
Units in µg/L
U = analyte not detected above concentration shown
B = analyte detected, but below contract required detection limit
CRQL - Contract Required Detection Limit
IDL - Instrument Detection Limit
W2 - Post digestion spike recovery exceeded upper control limit.
ES Exceedance -
PAL Exceedance -
* MW-S1 did not contain sufficient water to sample for metals and cyanide.

Table 3A
Metal and Cyanide Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	IDL	CRDL	NR140 PAL	NR140 ES	MW-S1A	MW-S1*	MW-S1AR	MW-S2	MW-S2A	MW-S2AR	MW-S3	MW-S3A
Analyte, µg/l												
Arsenic	1.0	10.0	5	50	14.4 U		2.3 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Barium	0.6	200	400	2000	309		580	1690	137 B	27.1 U	128 B	243
Chromium	3.6	10	10	100	3.6 U		3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Cyanide	2.5	10	40	200	2.5 U		2.5 U	2.5 U	3 U	2.5 U	2.5 U	2.5 U
Iron	6.6	100	150	300	18900		31800	2130	830	6.6 U	3480	41.5 U
Lead	1.0	3.0	1.5	15	1.0 U		1.0 U	1.0 U W2	1.0 U	1.0 U	1.0 U	1.0 U
Manganese	0.3	15	25	50	5910		12600	6660	3720	131	731	558
Mercury	0.03	0.2	0.2	2	0.17 U		0.3 U	0.22 U	0.19 U	0.12 U	0.37 U	0.32 U

Notes:
Samples collected in March 1996
Units in µg/L
U = analyte not detected above concentration shown
B = analyte detected, but below contract required detection limit
CRQL - Contract Required Detection Limit
IDL - Instrument Detection Limit
W2 - Post digestion spike recovery exceeded upper control limit.
ES Exceedance -
PAL Exceedance -
* MW-S1 did not contain sufficient water to sample for metals and cyanide.

Table 3A
Metal and Cyanide Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte, µg/l	IDL	CRDL	NR140 PAL	NR140 ES	MW-S3A (Dupe)	MW-S3AR	MW-FB01	MW-FB02	MW-FB03	Prep Blank	Prep Blank
Arsenic	1.0	10.0	5	50	1.0 U	1.0 U	1 U	1.0 U	1.0 U	2.220 B	1 U
Barium	0.6	200	400	2000	233	108 B	0.6 U	0.60 U	21.2 B	0.600 U	0.6 U
Chromium	3.6	10	10	100	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.600 U	3.6 U
Cyanide	2.5	10	40	200	2.5 U	2.5 U	3.7 U	2.5 U	2.5 U	2.500 U	2.5 U
Iron	6.6	100	150	300	40.6 U	537	6.6 U	6.6 U	6.6 U	14.429 B	15.359 B
Lead	1.0	3.0	1.5	15	1.0 U	1.0 U	1.2 B	1.0 U	1.2 B	1.000 U	1 U
Manganese	0.3	15	25	50	538	266	4.3 U	3.0 U	7.3 U	2.804 B	3.012 B
Mercury	0.03	0.2	0.2	2	0.31 U	0.22 U	0.03 U	0.16 U	0.17 U	0.118 B	0.079B

Notes:
Samples collected in March 1996
Units in µg/L
U = analyte not detected above concentration shown
B = analyte detected, but below contract required detection limit
CRQL - Contract Required Detection Limit
IDL - Instrument Detection Limit
W2 - Post digestion spike recovery exceeded upper control limit.
ES Exceedance -
PAL Exceedance -
* MW-S1 did not contain sufficient water to sample for metals and cyanide.

Table 3B
Metal and Cyanide Concentrations
Residential Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte, µg/l	IDL	CRDL	NR140 PAL	NR140 ES	RW-2543	RW-2543 (Dupe)	RW-2551	RW-FB01
Arsenic	1.0	10.0	5	50	1 U	1 U	1 U	1 U
Barium	0.6	200	400	2000	8.4 B	8.6 B	5.7 B	0.6 U
Chromium	3.6	10	10	100	3.6 U	3.6 U	3.6 U	3.6 U
Cyanide	2.5	10	40	200	2.5 U	2.5 U	2.5 U	2.5 U
Iron	6.6	100	150	300	6.6 U	6.6 U	6.6 U	6.6 U
Lead	1.0	3.0	1.5	15	1 U	1 U	1 U	1 U
Manganese	0.3	15	25	50	7.3 U	7.6U	5.2 U	3.3 U
Mercury	0.03	0.2	0.2	2	0.03U	0.03 U	0.03 U	0.03 U

Notes:
Samples collected in March 1996
Units in µg/L
U = analyte not detected above concentration shown
B = analyte detected, but below contract required detection limit
CRQL - Contract Required Detection Limit
IDL - Instrument Detection Limit
ES Exceedance - [redacted]
PAL Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-6D	MW-6S	MW-7D	MW-7S	MW-10S	MW-11S
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	1 U	1 U	1 U	0.6 J
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	1 U	2	1 U	1 U	0.1 J	1 U
1,1-Dichloroethene	1	0.7	7	1 U	0.1 J	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane - 1	1	0.5	5	1 U	0.8 J	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	5	--	--	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	5	200	1000	5 U	5 U	5 U	2 U	5 U	5 U
Benzene - 2	1	0.5	5	1 U	3	1 U	1 U	2	0.7 J
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1	80	400	1 U	1	1 U	1 U	0.2 J	1 U
Chloroform - 3	1	0.6	6	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	1	0.3	3	0.6 U	1 U	1 U	1 U	1 U	0.2 U
Cis-1,2-Dichloroethene - 5	1	7	70	1 U	2	1 U	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U	1 U	9	1 U
Methylene Chloride - 6	2	0.5	5	0.2 U	5 U	0.2 U	0.1 U	0.2 U	0.3 U
Styrene	1	10	100	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene - 7	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Toluene - 11	1	68.6	343	1 U	1 U	0.1 U	0.1 U	1 U	1 U
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene - 8	1	0.5	5	1 U	0.9 J	1 U	1 U	1 U	1 U
Vinyl Chloride - 4	1	0.02	0.2	1 U	2	1 U	1 U	0.3 J	1 U
Xylene (total) - 9	1	124	620	1 U	14 U	1 U	1 U	51 X	1 U
Bromochloromethane - 10	1	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	5	8	40	5 U	5 U	5 U	5 U	0.6 U	5 U
Dilution Factor				1.0	1.0	1.0	1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-13D	MW-13S	MW-13S (Dil)	MW-13S(Dupe)	MW-13S (Dupe Dil)
1,2-Dichlorobenzene	1	60	600	1 U	1 U	5 U	1 U	5 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	5 U	1 U	5 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	5 U	1 U	5 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	5 U	1 U	5 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	5 U	1 U	5 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	5 U	1 U	5 U
1,1-Dichloroethane	1	85	850	1 U	0.3 J	5 U	0.3 J	5 U
1,1-Dichloroethene	1	0.7	7	1 U	1 U	5 U	1 U	5 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	5 U	1 U	5 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	5 U	1 U	5 U
1,2-Dichloroethane - 2	1	0.5	5	1 U	1 U	5 U	1 U	5 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	5 U	1 U	5 U
2-Butanone	5	90	460	5 U	5 U	25 U	5 U	25 U
2-Hexanone	5	--	--	5 U	5 U	25 U	5 U	25 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	25 U	5 U	25 U
Acetone	5	200	1000	5 U	5 U	25 U	5 U	25 U
Benzene - 3	1	0.5	5	1 U	1	1 DJ	1	1 DJ
Bromodichloromethane	1	0.06	0.6	1 U	1 U	5 U	1 U	5 U
Bromoform	1	0.44	4.4	1 U	1 U	5 U	1 U	5 U
Bromomethane	1	1	10	1 U	1 U	5 U	1 U	5 U
Carbon Disulfide	1	--	--	1 U	1 U	5 U	1 U	5 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	5 U	1 U	5 U
Chlorobenzene	1	20	200	1 U	1 U	5 U	1 U	5 U
Chloroethane	1	80	400	1 U	1 U	5 U	1 U	5 U
Chloroform 4	1	0.6	6	1 U	1 U	5 U	1 U	5 U
Chloromethane	1	0.3	3	0.4 U	0.2 U	5 U	1 U	5 U
Cis-1,2-Dichloroethene - 5	1	7	70	1 U	0.7 J	0.5 DJ	0.8 J	0.6 DJ
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	5 U	1 U	5 U
Dibromochloromethane	1	6	60	1 U	1 U	5 U	1 U	5 U
Ethylbenzene	1	140	700	1 U	21	18 D	20	19 D
Methylene Chloride - 6	2	0.5	5	0.2 U	0.4 U	3 U	0.5 U	3 U
Styrene	1	10	100	1 U	1 U	5 U	1 U	5 U
Tetrachloroethene - 7	1	0.5	5	1 U	1 U	5 U	1 U	5 U
Toluene - 4	1	68.6	343	1U	0.2 U	5 U	0.8 U	5 U
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	5 U	1 U	5 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	5 U	1 U	5 U
Trichloroethene - 8	1	0.5	5	1 U	0.2 J	5 U	0.3 J	5 U
Vinyl Chloride - 1	1	0.02	0.2	1 U	0.3 J	5 U	0.2 J	5 U
Xylene (total) - 9	1	124	620	1 U	78 BXE	78 DX	73 BXE	87 DX
Bromochloromethane - 10	1	--	--	1 U	1 U	5 U	1 U	5 U
Naphthalene	5	8	40	5 U	5 U	0.8 U	5 U	25 U
Dilution Factor				1.0	1.0	5.0	1.0	5.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-14S	MW-15D	MW-15S	MW-19D	MW-19S	MW-19S (Dupe)
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1	0.7	7	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane - 2	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	5	--	--	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	5	200	1000	5 U	5 U	5 U	2 J	5 U	5 U
Benzene - 5	1	0.5	5	1 U	1 U	1 U	1 U	0.1 J	0.1 J
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1	80	400	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	1	0.6	6	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	1	0.3	3	1 U	0.3 U	0.2 U	0.3 U	0.2 U	0.2 U
Cis-1,2-Dichloroethene - 3	1	7	70	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U	1 U	0.5 J	0.6 J
Methylene Chloride - 6	2	0.5	5	0.3 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3 U
Styrene	1	10	100	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene - 7	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Toluene - 11	1	68.6	343	0.2 U	1 U	0.1 U	1 U	1 U	1 U
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene - 8	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total) - 9	1	124	620	1 U	1 U	1 U	1 U	5 X	6 X
Bromochloromethane - 10	1	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	5	8	40	5 U	5 U	5 U	5 U	5 U	5 U
Dilution Factor				1.0	1.0	1.0	1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-20S	MW-S1	MW-S1A	MW-S1A (Dil)	MW-S1AR
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	5 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	5 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	0.2 J	5 U	0.6 J
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	5 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	5 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	5 U	1 U
1,1-Dichloroethane	1	85	850	1 U	1 U	1	1 DJ	5
1,1-Dichloroethene	1	0.7	7	1 U	1 U	1 U	5 U	0.1 J
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	5 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	5 U	1 U
1,2-Dichloroethane - 1	1	0.5	5	1 U	1 U	1 U	5 U	0.3 J
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	5 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	25 U	20
2-Hexanone	5	--	--	5 U	5 U	5 U	25 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	0.3 J	25 U	15
Acetone	5	200	1000	5 U	4 U	5 U	25 U	59 U
Benzene - 2	1	0.5	5	**0.8 J**	1 U	**0.6 J**	**0.9 DJ**	**2**
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U	5 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	5 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	5 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	0.1 J	5 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	5 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	5 U	1 U
Chloroethane	1	80	400	1 U	4 U	1	5 U	0.6 J
Chloroform - 4	1	0.6	6	1 U	4 U	0.1 J	5 U	**2**
Chloromethane	1	0.3	3	0.2 U	0.4 U	1 U	0.8 U	0.5 U
Cis-1,2-Dichloroethene - 5	1	7	70	0.3 J	1 U	4.0	4 DJ	**22**
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	5 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U	5 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	2	1 DJ	6
Methylene Chloride - 6	2	0.5	5	0.2 U	4 U	5 U	7 U	5 U
Styrene	1	10	100	1 U	1 U	1 U	5 U	1 U
Tetrachloroethene - 7	1	0.5	5	1 U	1 U	0.3 J	5 U	0.4 J
Toluene - 11	1	68.6	343	1 U	1 U	17	16 D	**43 E**
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	0.1 J	5 U	0.4 J
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	5 U	1 U
Trichloroethene - 8	1	0.5	5	1 U	1 U	**1 E**	**1 DJ**	**4**
Vinyl Chloride - 1	1	0.02	0.2	**0.1 J**	4 U	**58 E**	**35 D**	**140 E**
Xylene (total) - 9	1	124	620	1 U	1 U	9 BX	8 U	**24 BX**
Bromochloromethane - 10	1	--	--	1 U	1 U	1 U	1 U	1U
Naphthalene	5	8	40	5 U	0.2 U	0.2 U	25 U	0.4 U
Dilution Factor				1.0	1.0	1.0	5.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-S1AR (Dil)	MW-S2	MW-S2A	MW-S2AR	MW-S3	MW-S3 (Dil)
1,2-Dichlorobenzene	1	60	600	10 U	1 U	1 U	1 U	1 U	5 U
1,3-Dichlorobenzene	1	125	1250	10 U	1 U	1 U	1 U	1 U	5 U
1,4-Dichlorobenzene	1	15	75	10 U	1 U	1 U	1 U	0.2 J	5 U
1,1,1-Trichloroethane	1	40	200	10 U	1 U	1 U	1 U	1 U	5 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	10 U	1 U	1 U	1 U	1 U	5 U
1,1,2-Trichloroethane	1	0.5	5	10 U	1 U	1 U	1 U	1 U	5 U
1,1-Dichloroethane	1	85	850	4 DJ	1 U	0.6 J	0.3 J	2	2 DJ
1,1-Dichloroethene	1	0.7	7	10 U	1 U	1 U	1 U	1 U	5 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	10 U	1 U	1 U	1 U	1 U	5 U
1,2-Dibromoethane	1	0.005	0.05	10 U	1 U	1 U	1 U	1 U	5 U
1,2-Dichloroethane	1	0.5	5	10 U	1 U	1 U	1 U	1 U	5 U
1,2-Dichloropropane	1	0.5	5	10 U	1 U	1 U	1 U	1 U	5 U
2-Butanone	5	90	460	50 U	5 U	5 U	5 U	5 U	25 U
2-Hexanone	5	--	--	50 U	5 U	5 U	5 U	5 U	25 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	13 U	5 U	5 U	5 U	5 U	25 U
Acetone	5	200	1000	50 U	5 U	5 U	5 U	5 U	25 U
Benzene	1	0.5	5	2 DJ	0.2 J	0.8 J	0.1 J	3	2 DJ
Bromodichloromethane	1	0.06	0.6	10 U	1 U	1 U	1 U	1 U	5 U
Bromoform	1	0.44	4.4	10 U	1 U	1 U	1 U	1 U	5 U
Bromomethane	1	1	10	10 U	1 U	1 U	1 U	1 U	5 U
Carbon Disulfide	1	--	--	10 U	1 U	1 U	1 U	1 U	5 U
Carbon Tetrachloride	1	0.5	5	10 U	1 U	1 U	1 U	1 U	5 U
Chlorobenzene	1	20	200	10 U	1 U	1 U	1 U	1 U	5 U
Chloroethane	1	80	400	10 U	1 U	0.1 J	1 U	3	3 DJ
Chloroform	1	0.6	6	1 DJ	1 U	1 U	1 U	8 U	5 U
Chloromethane	1	0.3	3	10 U	1 U	1 U	1 U	0.7 U	0.6 U
Cis-1,2-Dichloroethene	1	7	70	20 D	1 U	0.4 J	1 U	0.7 J	0.6 DJ
Cis-1-3-Dichloropropene	1	0.02	0.2	10 U	1 U	1 U	1 U	1 U	5 U
Dibromochloromethane	1	6	60	10 U	1 U	1 U	1 U	1 U	5 U
Ethylbenzene	1	140	700	4 DJ	1 U	2	1 U	20	19 D
Methylene Chloride -6	2	0.5	5	10 U	4 U	3 U	4 U	3 U	5 U
Styrene	1	10	100	10 U	1 U	1 U	1 U	1 U	5 U
Tetrachloroethene -7	1	0.5	5	10 U	1 U	1 U	1 U	1 U	5 U
Toluene -11	1	68.6	343	45 D	1 U	0.7 U	0.2 U	0.2 U	5 U
Trans-1-2-Dichloroethene	1	20	100	10 U	1 U	1 U	1 U	1 U	5 U
Trans-1-3-Dichloropropene	1	0.02	0.2	10 U	1 U	1 U	1 U	1 U	5 U
Trichloroethene -8	1	0.5	5	4 DJ	1 U	1 U	1 U	1 U	5 U
Vinyl Chloride	1	0.02	0.2	110 D	1 U	0.2 J	1 U	2	2 DJ
Xylene (total) -9	1	124	620	22 BDX	6 X	7 BX	0.2 U	80 XE	84 BDX
Bromochloromethane -10	1	--	--	10 U	1 U	1 U	1 U	1 U	5 U
Naphthalene	5	8	40	50 U	0.1 U	5 U	0.2 U	0.8 U	0.7 U
Dilution Factor				10.0	1.0	1.0	1.0	1.0	5.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-S3A	MW-S3A (Dupe)	MW-S3AR	MW-FB02	MW-FB03	MW-TB02
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	2	2	0.4 J	1 U	1 U	1 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	13	13	12	1 U	1 U	1 U
1,1-Dichloroethene	1	0.7	7	0.2 J	0.2 J	0.2 J	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane -2	1	0.5	5	4	4	4	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	5	5 U	5 U
2-Hexanone	5	--	--	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	5	200	1000	5 U	5 U	5 U	8	7	5 U
Benzene -3	1	0.5	5	3	3	1.0	1 U	1 U	1 U
Bromodichloromethane	1	0.06	0.6	1 U	1 U	0.3 J	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1	80	400	10	9	6	1 U	1 U	2 U
Chloroform	1	0.6	6	1 U	1 U	0.3 J	1 U	1 U	2 U
Chloromethane	1	0.3	3	0.4 U	0.4 U	1 U	1 U	1 U	0.4 J
Cis-1,2-Dichloroethene -4	1	7	70	5	6	6	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	0.2 J	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride -6	2	0.5	5	6 U	5 U	6 U	0.2 U	6 B	0.4 JB
Styrene	1	10	100	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene -7	1	0.5	5	1 U	1 U	1 U	1 U	1 U	1 U
Toluene -11	1	68.6	343	0.2 U	0.1 U	0.3 U	0.1 J	0.2 J	1 U
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene -8	1	0.5	5	0.2 J	0.2 J	0.2 J	1 U	1 U	1 U
Vinyl Chloride -1	1	0.02	0.2	5	4	2	1 U	1 U	2 U
Xylene (total) -9	1	124	620	2 U	2 U	0.5 U	1 U	0.1 JX	1 U
Bromochloromethane -10	1	--	--	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	5	8	40	0.9 U	0.9 U	1 U	5 U	5 U	5 U
Dilution Factor				1.0	1.0	1.0	1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	MW-TB03	MW-FB01	MW-TB01	Method Blank 01	Method Blank 16
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	0.1 J	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1	0.7	7	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	5 U	5 U
2-Hexanone	5	--	--	5 U	5 U	5 U	1 J	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U	0.8 J	5 U
Acetone	5	200	1000	3 J	7	4 J	5 U	5 U
Benzene	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	1 U	1 U
Chloroethane	1	80	400	3 U	1 U	1 U	1 U	1 U
Chloroform	1	0.6	6	3 U	1 U	1 U	1 U	1 U
Chloromethane	1	0.3	3	1 U	**0.4 J**	**0.5 J**	1 U	1 U
Cis-1,2-Dichloroethene	1	7	70	1 U	1 U	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	2	0.5	5	**8 B**	0.2 U	4 U	**0.5 J**	**0.9 J**
Styrene	1	10	100	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Toluene	1	68.6	343	0.1 J	0.2 J	1 U	1 U	0.2 J
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	1 U	1 U	1 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	1	0.02	0.2	3 U	1 U	1 U	1 U	1 U
Xylene (total)	1	124	620	1 U	1 U	1 U	0.1 JX	0.5 JX
Bromochloromethane	1	--	--	1 U	1 U	1 U	1 U	1 U
Naphthalene	5	8	40	0.1 U	5 U	5 U	3 J	0.4 J
Dilution Factor				1.0	1.0	1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	Method Blank 17	Method Blank 18	Method Blank 20	Method Blank 36
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1	0.7	7	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	0.5	5	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	5 U
2-Hexanone	5	--	--	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U	5 U
Acetone	5	200	1000	5 U	5 U	5 U	5 U
Benzene	1	0.5	5	1 U	1 U	1 U	1 U
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	1 U
Chloroethane	1	80	400	1 U	1 U	1 U	1 U
Chloroform	1	0.6	6	1 U	1 U	1 U	1 U
Chloromethane	1	0.3	3	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	1	7	70	1 U	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U	1 U
Methylene Chloride	2	0.5	5	**0.9 J**	**0.7 J**	0.2 J	0.3 J
Styrene	1	10	100	1 U	1 U	1 U	1 U
Tetrachloroethene	1	0.5	5	1 U	1 U	1 U	1 U
Toluene	1	68.6	343	1 U	1 U	1 U	1 U
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	1 U	1 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U
Trichloroethene	1	0.5	5	1 U	1 U	1 U	1 U
Vinyl Chloride	1	0.02	0.2	1 U	1 U	1 U	1 U
Xylene (total)	1	124	620	1 U	1 U	1 U	1 U
Bromochloromethane	1	--	--	1 U	1 U	1 U	1 U
Naphthalene	5	8	40	0.6 J	0.6 J	0.5 J	0.7 J
Dilution Factor				1.0	1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected *above concentration listed*
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4A
Volatile Organic Compound Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte	CRQL	NR140 PAL	NR140 ES	Method Blank 37	Storage Blank 031596	Storage Blank 031496
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	1 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	1 U	1 U	1 U
1,1-Dichloroethene	1	0.7	7	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U
1,2-Dichloroethane	1	0.5	5	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U
2-Hexanone	5	--	--	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U
Acetone	5	200	1000	5 U	5 U	5 U
Benzene	1	0.5	5	1 U	1 U	1 U
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U
Chloroethane	1	80	400	1 U	1 U	1 U
Chloroform	1	0.6	6	1 U	1 U	1 U
Chloromethane	1	0.3	3	1 U	1 U	1 U
Cis-1,2-Dichloroethene	1	7	70	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U
Methylene Chloride	2	0.5	5	0.4 J	**1 BJ**	**0.9 BJ**
Styrene	1	10	100	1 U	1 U	1 U
Tetrachloroethene	1	0.5	5	1 U	1 U	1 U
Toluene	1	68.6	343	1 U	0.2 J	0.2 J
Trans-1-2-Dichloroethene	1	20	100	1 U	1 U	1 U
Trans-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U
Trichloroethene	1	0.5	5	1 U	1 U	1 U
Vinyl Chloride	1	0.02	0.2	1 U	1 U	1 U
Xylene (total)	1	124	620	0.1 JX	0.6 JX	0.6 JX
Bromochloromethane	1	--	--	1 U	1 U	1 U
Naphthalene	5	8	40	1 J	0.2 BJ	0.3 BJ
Dilution Factor				1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
D = Concentration determined on a diluted sample.
PAL Exceedance -
ES Exceedance -

Table 4B
Volatile Organic Compound Concentrations
Residential Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

Analyte, µg/l	CRQL	NR140 PAL	NR140 ES	RW-TB01	RW-2543	RW-2543 (Dupe)	RW-2551	RW-FB01
1,2-Dichlorobenzene	1	60	600	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1	125	1250	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1	15	75	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	1	40	200	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1	85	850	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1	0.7	7	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	1	0.005	0.05	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	0.5	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1	0.5	5	1 U	1 U	1 U	1 U	1 U
2-Butanone	5	90	460	5 U	5 U	5 U	5 U	4 J
2-Hexanone	5	--	--	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone (MIBK)	5	50	500	5 U	5 U	5 U	5 U	5 U
Acetone	5	200	1000	3 J	5 U	3 U	5 U	7
Benzene	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	1	0.06	0.6	1 U	1 U	1 U	1 U	1 U
Bromoform	1	0.44	4.4	1 U	1 U	1 U	1 U	1 U
Bromomethane	1	1	10	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	1	--	--	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1	20	200	1 U	1 U	1 U	1 U	1 U
Chloroethane	1	80	400	1 U	1 U	1 U	1 U	1 U
Chloroform	1	0.6	6	1 U	1 U	1 U	1 U	1 U
Chloromethane	1	0.3	3	0.5 J	0.6 U	1 U	0.8 U	0.5 J
Cis-1,2-Dichloroethene	1	7	70	1 U	1 U	1 U	1 U	1 U
Cis-1-3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	1	6	60	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1	140	700	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	2	0.5	5	0.5 U	0.2 U	0.3 U	0.2 U	0.3 U
Styrene	1	10	100	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Toluene	1	68.6	343	1 U	1 U	1 U	1 U	0.2 J
Trans-1,2-Dichloroethene	1	20	100	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1	0.5	5	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	1	0.02	0.2	1 U	1 U	1 U	1 U	1 U
Xylene (total)	1	124	620	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	1	--	--	1 U	1 U	1 U	1 U	1 U
Naphthalene	5	8	40	5 U	5 U	5 U	5 U	5 U
Dilution Factor				1.0	1.0	1.0	1.0	1.0

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
B = compound also detected in associated blank
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
X = Concentration of total xylene. Isomer(s) not identified.
PAL Exceedance -
ES Exceedance -

Table 5A
Phthalate Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	CRQL	NR140 PAL	NR140 ES	MW-6D	MW-6S	MW-7D	MW-7S	MW-10S	MW-11S	MW-13D	MW-13S
Analyte, µg/l											
bis(2-Ethylhexyl)Phthalate	10	0.6	6	12 U	0.8 U	0.9 U	2 U	3 U	2 U	1 U	1 U
Di-n-Butylphthalate	10	--	--	0.5 U	0.7 U	0.4 U	0.5 U	0.7 U	0.6 U	1 U	0.7 U
Diethylphthalate	10	--	--	10 U	10 U	10 U	10 U	0.3 J	0.5 J	10 U	0.3 U

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
* - Monitoring Well MW-S1 did not contain sufficient water to sample for phthalates.

PAL Exceedance -
ES Exceedance -

Table 5A
Phthalate Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	CRQL	NR140 PAL	NR140 ES	MW-13S (dupe)	MW-13S (dupe) Reanalysis	MW-14S	MW-15D	MW-15S	MW-19D	MW-19S
Analyte, µg/l										
bis(2-Ethylhexyl)Phthalate	10	0.6	6	0.9 U	1 U	0.8 U	9 U	2 U	2 U	0.5 U
Di-n-Butylphthalate	10	--	--	0.2 U	0.3 U	0.5 U	1 U	1 U	0.6 U	0.5 U
Diethylphthalate	10	--	--	10 U	0.3 J	10 U	10 U	0.7 U	10 U	10 U

Notes:
Samples collected in March 1996
Units in µg/L
U = *compound not detected above concentration listed*
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
* - Monitoring Well MW-S1 did not contain sufficient water to sample for phthalates.

PAL Exceedance -
ES Exceedance -

Table 5A
Phthalate Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	CRQL	NR140 PAL	NR140 ES	MW-19S (dupe)	MW-20S	MW-S1*	MW-S1A	MW-S1AR	MW-S2	MW-S2A	MW-S2AR
Analyte, µg/l											
bis(2-Ethylhexyl)Phthalate	10	0.6	6	0.9 U	0.9 U		6 U	5 U	6 U	2 U	2 U
Di-n-Butylphthalate	10	--	--	0.6 U	0.5 U		0.7 U	0.7 U	0.6 U	0.5 U	2 U
Diethylphthalate	10	--	--	10 U	10 U		0.6 J	2 J	10 U	10 U	0.2 J

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
* - Monitoring Well MW-S1 did not contain sufficient water to sample for phthalates.

PAL Exceedance -
ES Exceedance - [redacted]

Table 5A
Phthalate Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	CRQL	NR140 PAL	NR140 ES	MW-S3	MW-S3A	MW-S3A (dupe)	MW-S3AR	MW-FB02	MW-FB03	MW-FB01
Analyte, µg/l										
bis(2-Ethylhexyl)Phthalate	10	0.6	6	8 U	5 U	7 U	26 B	0.8 BJ	2 BJ	10 U
Di-n-Butylphthalate	10	--	--	0.5 U	0.5 U	0.9 U	0.7 U	0.7 BJ	0.7 J	10 U
Diethylphthalate	10	--	--	0.5 J	0.5 J	0.6 J	0.6 J	10 U	10 U	10 U

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
* - Monitoring Well MW-S1 did not contain sufficient water to sample for phthalates.

PAL Exceedance -
ES Exceedance -

Table 5A
Phthalate Concentrations
Groundwater Monitoring Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	CRQL	NR140 PAL	NR140 ES	Method Blank 10	Method Blank 12	Method Blank 18	Method Blank 38
Analyte, µg/l							
bis(2-Ethylhexyl)Phthalate	10	0.6	6	**2 J**	**2 J**	**2 J**	**4 J**
Di-n-Butylphthalate	10	--	--	0.5 J	0.9 J	10 U	0.5 J
Diethylphthalate	10	--	--	0.3 J	10 U	10 U	10 U

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
J = compound detected, but below contract required quantitation limit
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
* - Monitoring Well MW-S1 did not contain sufficient water to sample for phthalates.

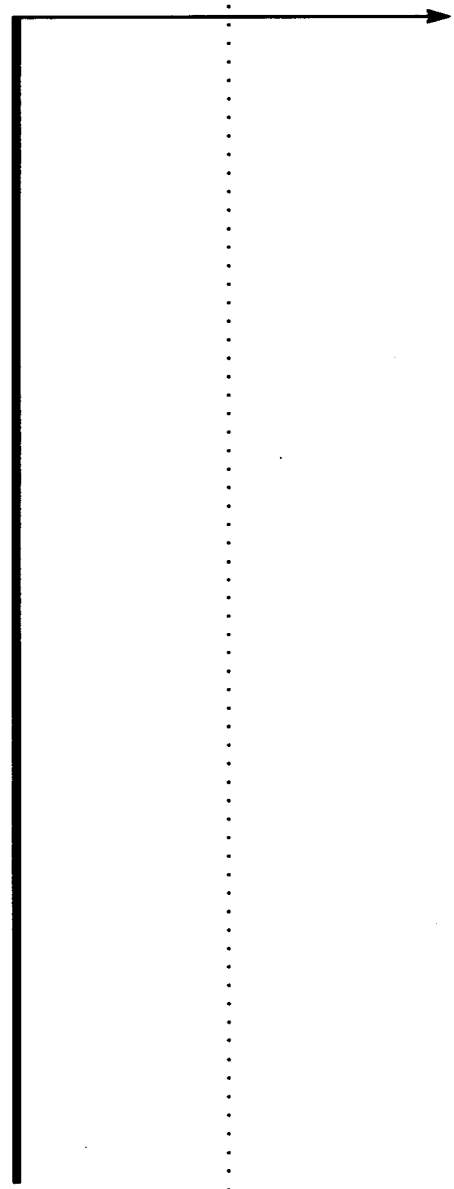
PAL Exceedance -
ES Exceedance -

Table 5B
Phthalate Concentrations
Residental Wells
Round 1 Long Term Groundwater Monitoring
Spickler Landfill Site
STS Project No. 84374XA

	CRQL	NR140 PAL	NR140 ES	RW-2543	RW-2543 (dupe)	RW-2551	RW-FB01
Analyte, µg/l							
bis(2-Ethylhexyl)Phthalate	10	0.6	6	10 U	0.6 U	2 U	3 U
Di-n-Butylphthalate	10	--	--	0.5 U	0.4 U	0.6 U	0.5 U
Diethylphthalate	10	--	--	10 U	10 U	10 U	10 U

Notes:
Samples collected in March 1996
Units in µg/L
U = compound not detected above concentration listed
-- = No NR140 ES or PAL established
CRQL - Contract Required Quantitation Limit
ES Exceedance - [redacted]

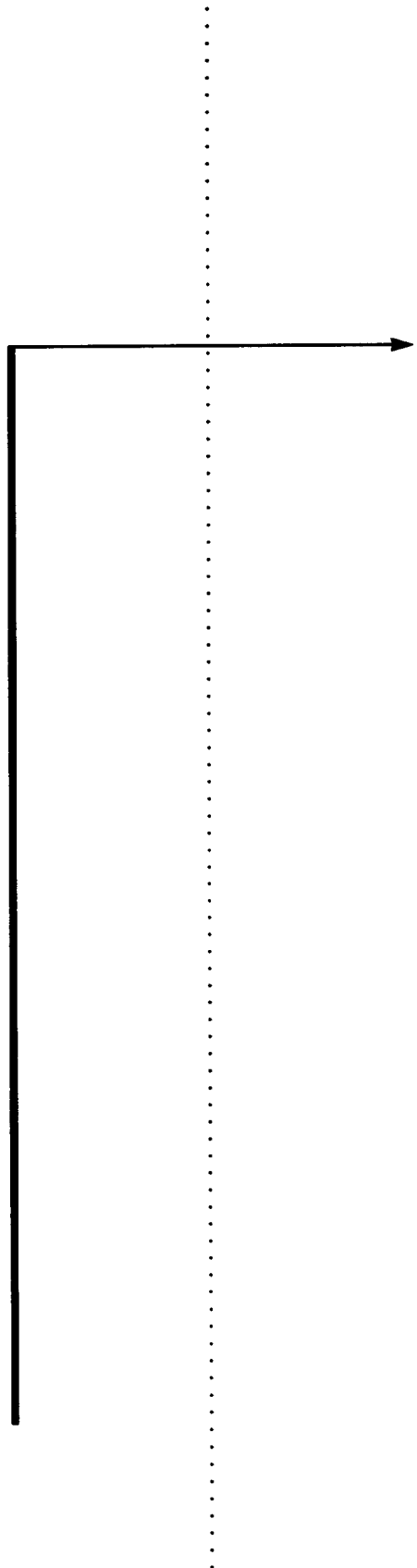
APPENDIX



LIST OF APPENDICES

STS

A



APPENDIX A

Field Sampling Sheets

STS Geo-Environmental Group
Field Report

Project No. 84374xA

Project Spickler LF

Day/Date Mon 3/11/96

Location Spencer WI

Weather/Temp. 30's

Contractor

Client Weyerhaeuser

Equipment Rental

Tolls $

Parking $

Mileage

Arrive Job 10:00

Depart Job 4:30

Total Hours on Job 6.5

Lab Time 1.0

Travel Time 4.0

TOTAL CHARGEABLE HOURS 11.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Collected wate levels from all wells on site except for wells S-1 & S1A which were not located. Wate levels From all leachate head wells on site. Depth to Wate and Depth to well Bottom were recorded with a wate level indicator. Well puc Stickup Was not measured due to Snow cover.

Gas levels were monitored in 10 GAS probes and wells 13S, 6S S-3. Well S-1 Was not located. Concentrations of % chy, CO_2 Were measured with GA-90 Infared gas detector.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By David Maker.
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

005/FF12/89WP15K

Spickler

STS

WATER LEVEL DATA SHEET

Project: Spickler LF Project No.: ~~84374xA~~ 84374xH

Observer: DCM Weather: 30's overcast Date: 3/11/96

Type Water Level Indicator Used: Slope Indicator I.D. No: 13688

Well/Piez. Number	Clock Time	Casing Stick-Up (Ft)	Casing Top Elev. (Ft)	Depth To Water (Ft)	Depth To Bottom (Ft)	Water Elev. (Ft)	Remarks
20S		N/A Snow Cover		5.43	21.72		
14D		N/A Snow Cover		17.29	62.25		
14S		N/A Snow Cover		11.71	26.19		
15~~D~~S		N/A Snow Cover		14.28	27.45		
15D		N/A Snow Cover		20.54	72.73		
18S		N/A Snow Cover		14.40	26.36		
6S		N/A Snow Cover		13.88	28.14		
6D		N/A Snow Cover		18.32	62.15		
12D		N/A Snow Cover		19.43	62.45		
12S		N/A Snow Cover		12.54	27.70		
16S		N/A Snow Cover		5.28	20.90		
11S		N/A Snow Cover		8.08	20.54		
8S		N/A Snow Cover		12.12	22.52		
8D		N/A Snow Cover		32.82	47.65		
7D		N/A Snow Cover		29.28	62.30		
7S		N/A Snow Cover		20.16	24.09		
10D		N/A Snow Cover		32.99	62.50		
10S		N/A Snow Cover		6.78	20.70		

Note reference point used if not top of PVC riser casing:

Additional Remarks:

Spickler

STS

WATER LEVEL DATA SHEET

Project: Spickler LF Project No.: 84574xA

Observer: DCM Weather: 30's overcast Date: 3/11/96

Type Water Level Indicator Used: Slope Indicator I.D. No: [redacted]

Well/Piez. Number	Clock Time	Casing Stick-Up (ft)	Casing Top Elev. (ft)	Depth To Water (ft)	Depth To Bottom (ft)	Water Elev. (ft)	Remarks
S-3		N/A Snow Cover		15.78	20.32		
S-3A		N/A Snow Cover		17.80	83.96		
9S		N/A Snow Cover		16.70	28.8		
13D		N/A Snow Cover		16.92	62.75		
13S		N/A Snow Cover		11.48	23.50		
S2A		FLUSH (2.4) MOUNT		16.14	23.59		
S2		FLUSH (2) MOUNT		5.76	12.05		
17S		N/A Snow Cover		15.28	18.61		
[redacted]40		N/A Snow Cover		35.98	52.05		
[redacted]MS		N/A Snow Cover		18.01	21.10		
LH8		[illegible]		17.86	24.15		
LH6		+3.20 ~~+3.20~~		16.05	20.28		
LH9		+3.90		Dry	11.42		
LA4		—		Damaged			
LH7		+2.55		6.74	7.00		
S-1		Flush		17.2	21.05		3/11/96
S-1A		Flush		34.25	49.25		3/11/96

*Note reference point used if not top of PVC riser casing:

Additional Remarks:

STS Geo-Environmental Group
Field Report

Project No. 84374xA

Project Spickler LF

Location Spencer WI

Contractor

Day/Date Tues 3/12/96

Weather/Temp. 50's ptly cldy

Client Weyerhaeuser

Equipment Rental

Tolls $

Parking $

Mileage

Arrive Job 7:00

Depart Job 5:30

Total Hours on Job 10.5

Lab Time —

Travel Time —

TOTAL CHARGEABLE HOURS 10.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Purged & Sampled the Following wells: 20S, 14S, 15S, 13S + Dupe 13D 15D, 6S, 19D, 19S + Dupe, FB01.

Disposable Bailers were used to purge four well volumes from each well. Well 19D Bailed Dry and Was let to recharge prior to Sampling. At each Site 3-40 ml Hcl vials, 2-l Amber no pres, 1-l HNO3 Filtred, 1-l NaOH were collected. FB01 Was Complete with Store bought Distilled Wate.

All purge Wate Was Disposed of into leachate Collection System. ph, Cond & Temperature Was measured and recorded in field book Along with observations of Color, odor & Turbidity.

Samples were Stored on Ice After Collection.

E & E oversight representative on site.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By D. Makal
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

005FF12/89WP15K

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 20 S
Previous Well Sampled: _____

Job No.: 84374xA
Tester: Dcm
Date Sampled: 3/12/96

GENERAL CONDITIONS:

N/A Snow cover

Surface Seal: OK / Damaged / Missing: _____
Protector Pipe: (OK) / Damaged / Missing: _____
Well Cap: (OK) / Damaged / Missing: If Missing **Replaced?**
Temperature: _____ Clear/Cloudy/Rain

WELL DATA:

Measuring Device: M scope
Stick Up or Down: N/A (Snow Covered) (from Ground Surface)
Depth to Water: 5.43 (from TPVC)
Depth to Bottom: 21.72 (from TPVC)
Length of Water: 16.29
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Bailer
Sampling Device: Disposable Bailer
Volume Required: 30
Volume Purged: 30
Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 7:55 Time Ended: 8:36
Total Time Spent Purging: 41 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: light Brown
pH: 6.05 @ 6.0 °C
Uncorrected Conductivity: 119 x 1
Water Temp. (from Cond.) 6.1
Comments Corrected cond 191 umohs/cm

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 14S
Previous Well Sampled: _____

Job No.: 84374xA
Tester: Dcm
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ N/A Snow cover Damaged Missing: _____
Protector Pipe: OK Damaged Missing: _____
Well Cap: OK Damaged Missing: If Missing **Replaced?**
Temperature: 30's -40 Clear/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow Covered (from Ground Surface)
Depth to Water: 11.71 (from TPVC)
Depth to Bottom: 26.91 (from TPVC)
Length of Water: 15.20
Free Product Observed: yes/no Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Bailer Sampling Device: Disposable Bailer
Volume Required: 30 gallons
Volume Purged: 30 gallons Water Level After: _____
Could Well Bail Dry? yes no

Purging – Time Start: 8:45 Time Ended: 9:30
Total Time Spent Purging: 45 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Turbidity: clear turbid opaque
Odor: none
Color: light Brown
pH: 6.19 @ 7.5 °C
Uncorrected Conductivity: 70 x 1
Water Temp. (from Cond.) 7.9
Comments 106 Corrected Cond umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3- 40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer WI
Well Number: 15S
Previous Well Sampled: _____

Job No.: 84374xA
Tester: DCM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow cover Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing Replaced?
Temperature: 40 Clear (Cloudy) Rain

WELL DATA:

Measuring Device: m Scope
Stick Up or Down: N/A (Snow cover) (from Ground Surface)
Depth to Water: 14.28 (from TPVC)
Depth to Bottom: 27.45 (from TPVC)
Length of Water: 13.17
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Sampling Device: Disposable Bailer
Volume Required: 26 gallons
Volume Purged: 26 gallons Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 9:28 Time Ended: 10:05
Total Time Spent Purging: 30 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: light Red
pH: 6.26 @ 6.7 °C
Uncorrected Conductivity: 99 x 1
Water Temp. (from Cond.) 7.0
Comments corrected cond 155 umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3	HCl
Metals–	1-L	HNO_3
Indicator Parameters	NONE	2-L
Indicator Parameters	1-L	NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 13S + DUPE
Previous Well Sampled: _____

Job No.: 84374xA
Tester: DCM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow cover Damaged Missing: _____
Protector Pipe: OK Damaged Missing: _____
Well Cap: OK Damaged Missing: If Missing **Replaced?**
Temperature: 40 Clear (Cloudy) Rain

WELL DATA:

Measuring Device: mscope
Stick Up or Down: N/A Snow cover (from Ground Surface)
Depth to Water: 11.48 (from TPVC)
Depth to Bottom: 23.50 (from TPVC)
Length of Water: 12.02
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Sampling Device: Disposable
Volume Required: 24
Volume Purged: 25 Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 10:45 Time Ended: 11:25
Total Time Spent Purging: 40 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: Slight Teachate/organic?
Color: light Grey
pH: 6.19 @ 9.4 °C
Uncorrected Conductivity: 228 x 1
Water Temp. (from Cond.) 9.9

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 mL	HCl
Metals–	1-L	HNO3
Indicator Parameters	NONE	2-L
Indicator Parameters	1-L	NaOH

Comments: corrected cond 327 umhos/cm

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer WI
Well Number: 13D
Previous Well Sampled:

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow cover Damaged Missing:
Protector Pipe: OK Damaged Missing:
Well Cap: OK Damaged Missing: If Missing **Replaced?**
Temperature: 40 Clear/(Cloudy)/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow Cover (from Ground Surface)
Depth to Water: 16.42 (from TPVC)
Depth to Bottom: 62.75 (from TPVC)
Length of Water: 46.33
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Volume Required: 25 gallons
Volume Purged: 25
Could Well Bail Dry? yes (no)

Sampling Device: Disposable Bailer
Water Level After:

Purging – Time Start: 10:45 Time Ended: 11:45
Total Time Spent Purging: 1 hr

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.57 @ 9.3 °C
Uncorrected Conductivity: 29 x 1
Water Temp. (from Cond.) 9.1

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-ℓ	HNO3
Indicator Parameters		NONE 2-ℓ
Indicator Parameters		1-ℓ NaOH

Comments
Corrected Cond 29 umhos/cm

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 150
Previous Well Sampled:

Job No.: 84374xA
Tester: DCM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow Cover Damaged Missing:
Protector Pipe: OK Damaged Missing:
Well Cap: OK Damaged Missing: If Missing Replaced?
Temperature: 40
Clear/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow Cover (from Ground Surface)
Depth to Water: 20.54 (from TPVC)
Depth to Bottom: 72.73 (from TPVC)
Length of Water: 52.19
Free Product Observed: yes/no Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Volume Required: 25 gallons
Volume Purged: 25 gallons
Could Well Bail Dry? yes no

Sampling Device: Disposable Bailer
Water Level After:

Purging – Time Start: 10:40 Time Ended: 10:52
Total Time Spent Purging: 50 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear turbid opaque
Odor: none
Color: Clear
pH: 6.60 @ 9.8 °C
Uncorrected Conductivity: 23 x1
Water Temp. (from Cond.) 10.0

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO_3
Indicator Parameters		NONE 2-L
Indicator Parameters		1 L NaOH

Comments
corrected Cond 33 umhos/cm

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickle
Location: Spencer
Well Number: 6S
Previous Well Sampled:

Job No.: 84374xA
Tester: DCM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow cover Damaged Missing:
Protector Pipe: (OK) Damaged Missing:
Well Cap: (OK) Damaged Missing: ~~If~~ Missing **Replaced?**
Temperature: 40's Clear/(Cloudy)/Rain

WELL DATA:

Measuring Device: mScope
Stick Up or Down: N/A Snow Cover (from Ground Surface)
Depth to Water: 13.88 (from TPVC)
Depth to Bottom: 28.14 (from TPVC)
Length of Water: 14.26
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Sampling Device: Disposable
Volume Required: 27
Volume Purged: 27 Water Level After:
Could Well Bail Dry? yes (no)

Purging – Time Start: 14:45 Time Ended: 15:20
Total Time Spent Purging: 35 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: light Grey | Brown
pH: 5.40 @ 38.4 °C
Uncorrected Conductivity: 149 x 10
Water Temp. (from Cond.) 8.9

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 m	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-E
Indicator Parameters		1-C NaOH

Comments
220 corrected cond umhos/cm

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 195 + Dupe
Previous Well Sampled:

Job No.: 89374xA
Tester: DLM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow Cover Damaged Missing:
Protector Pipe: (OK) Damaged Missing:
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 40
Clear / (Cloudy) / Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow Cover (from Ground Surface)
Depth to Water: 8.01 (from TPVC)
Depth to Bottom: 21.10 (from TPVC)
Length of Water: 13.09
Free Product Observed: yes / (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Volume Required: 25
Volume Purged: 25
Could Well Bail Dry? yes (no)

Sampling Device: Disposable Bailer
Water Level After:

Purging – Time Start: 14:25 Time Ended: 15:00
Total Time Spent Purging: 45 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: leachate
Color: light Grey
pH: 6.13 @ 10.6 °C
Uncorrected Conductivity: 62 x 10 Ωcm
Water Temp. (from Cond.) 11.0
Comments

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-ℓ	HNO_3
Indicator Parameters		NONE 2-ℓ
Indicator Parameters		1-ℓ NaOH

861 corrected cond umhos/cm

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 19 D
Previous Well Sampled:

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow Cover Damaged Missing:
Protector Pipe: (OK) Damaged Missing:
Well Cap: (OK) Damaged Missing: If Missing Replaced?
Temperature: 40 Clear (Cloudy) Rain

WELL DATA:

Measuring Device: m Scope
Stick Up or Down: N/A Snow cover (from Ground Surface)
Depth to Water: 35.98 (from TPVC)
Depth to Bottom: 52.05 (from TPVC)
Length of Water: 16.07
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Sampling Device: Disposable Bailer
Volume Required: 20
Volume Purged: 13 gallons Water Level After:
Could Well Bail Dry? (yes) no

Purging – Time Start: 14:25 Time Ended: 15:15
Total Time Spent Purging: 30 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Turbidity: clear (turbid) opaque
Odor: none
Color: light Brown
pH: 5.48 @ 10.5 °C
Uncorrected Conductivity: 53 x 1
Water Temp. (from Cond.) 11.0
Comments

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters	NONE	2-L
Indicator Parameters	1-L	NaOH

Corrected Cond 74 umhos/cm

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: FB01
Previous Well Sampled: _____

Job No.: 84374xA
Tester: DCM
Date Sampled: 3/12/96

GENERAL CONDITIONS:

Surface Seal:	OK	Damaged	Missing: N/A Sand cover N/A
Protector Pipe:	(OK)	Damaged	Missing:
Well Cap:	(OK)	Damaged	Missing: If Missing **Replaced?**
Temperature:	40's		Clear ~~Cloudy~~ Rain

WELL DATA:

Measuring Device: N/A
Stick Up or Down: _____ (from Ground Surface)
Depth to Water: _____ (from TPVC)
Depth to Bottom: _____ (from TPVC)
Length of Water: _____
Free Product Observed: yes/no Thickness: _____ (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: N/A
Sampling Device: _____
Volume Required: _____
Volume Purged: _____
Water Level After: _____
Could Well Bail Dry? yes no

Purging – Time Start: _____ Time Ended: _____
Total Time Spent Purging: _____

Decon Method: Cleaned in office/Field Decon Method: _____

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.60 @ 12.9 °C
Uncorrected Conductivity: 4 x 1
Water Temp. (from Cond.) 13.0
Comments corrected cond 5 Umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

STS Geo-Environmental Group
Field Report

Project No. 84374xA

Project Spickler LF

Location Spencer WI

Contractor

Day/Date 3/13/96 Wed

Weather/Temp. 50's clear

Client Weyerhaeuser

Equipment Rental

Tolls $

Parking $

Mileage

Arrive Job 7:00

Depart Job 5:30

Total Hours on Job 10.5

Lab Time —

Travel Time —

TOTAL CHARGEABLE HOURS 10.5

Summary of Technical and/or Engineering Services Performed, Including Field Test Data. Locations, Elevations and Depths are Estimated.

Completed Wells: 1S, 6D, 7S, 7D 10S, FB02, RW2543, 2543 Dupe, 2551 RW FB01

Monitoring Wells were purged and Sampled with Disposable Bailers. Four well volumes were removed unless the well bailed dry. Wells that Bailed dry were let to recharge prior to sampling. AT each Site 3-40 ml HCl vials, 2-l Amber no pres, 1-l HNO3 & 1-l NaOH were collected. metals Sample (HNO3) was filtered. ph, cond & Temp. were measured and recorded in field book along with observations of color odor & Turbidity.

Well purge water contained in leachate collection System.

4 Coolers Shipped to Houlton Via Dunham Express.

Attempted to locate wells S1 & S1A - wells not found.

Recorded Panel readings from leachate collection System main Panel at lift Station 1 & 2.

*☐ Field Test Data is Estimated Pending Final Laboratory Test Results.

Site Sketch: Indicate North

Field Representative

Position

Company

By D. Makle 2.
STS Consultants, Ltd.

2 WHITE OFFICE • YELLOW TIME CARD • WHITE FIELD

005FF12/89WP15K

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: FB02
Previous Well Sampled: _____

Job No.: 84374xD
Tester: DCM
Date Sampled: 3/13/96

GENERAL CONDITIONS: N/A

Surface Seal:	OK	Damaged	Missing: _____
Protector Pipe:	OK	Damaged	Missing: _____
Well Cap:	OK	Damaged	Missing: If Missing **Replaced?**
Temperature: _____			Clear/Cloudy/Rain

WELL DATA: N/A

Measuring Device: _____
Stick Up or Down: _____ (from Ground Surface)
Depth to Water: _____ (from TPVC)
Depth to Bottom: _____ (from TPVC)
Length of Water: _____
Free Product Observed: yes/no Thickness: _____ (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

N/A

Purging Device: _____ Sampling Device: _____
Volume Required: _____
Volume Purged: _____ Water Level After: _____
Could Well Bail Dry? yes no

Purging – Time Start: _____ Time Ended: _____
Total Time Spent Purging: _____

Decon Method: Cleaned in office/Field Decon Method: _____

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.39 @ 13.2 °C
Uncorrected Conductivity: 2 x 1
Water Temp. (from Cond.) 13.1
Comments corrected cond 3 umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-2	HNO3
Indicator Parameters		NONE 2-2
Indicator Parameters		1-2 NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer
Well Number: 70
Previous Well Sampled:

Job No.: 84374xA
Tester: Dcm
Date Sampled: 3/13/96

GENERAL CONDITIONS:

Surface Seal:	~~OK~~ Snow Cover	Damaged	Missing:
Protector Pipe:	OK	Damaged	Missing:
Well Cap:	OK	Damaged	Missing: If Missing **Replaced?**
Temperature:	40's		(Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow Cover (from Ground Surface)
Depth to Water: 29.28 (from TPVC)
Depth to Bottom: 62.30 (from TPVC)
Length of Water: 33.02
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Volume Required: 25
Volume Purged: 25
Could Well Bail Dry? yes (no)

Sampling Device: Disposable
Water Level After:

Purging – Time Start: 10:05 Time Ended: 10:50
Total Time Spent Purging: 45 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 5.87 @ 10.2 °C
Uncorrected Conductivity: 29 x 1
Water Temp. (from Cond.) 10.3
Comments 41 corrected cond µmhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO_3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer WI
Well Number: 105
Previous Well Sampled:

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/13/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow cover Damaged Missing:
Protector Pipe: OK Damaged Missing:
Well Cap: OK Damaged Missing: If Missing **Replaced?**
Temperature: 40 (Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow cover (from Ground Surface)
Depth to Water: 6.78 (from TPVC)
Depth to Bottom: 20.70 (from TPVC)
Length of Water: 13.92
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Volume Required: 28 gallons
Volume Purged: 28
Could Well Bail Dry? yes (no)

Sampling Device: Disposable
Water Level After:

Purging – Time Start: 8:10 Time Ended: 9:40
Total Time Spent Purging: 1hr 30 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: leachate
Color: grey
pH: 5.93 @ 8.9 °C
Uncorrected Conductivity: 417 x 1
Water Temp. (from Cond.) 9.0

Samples Collected	#/Size	Preservatives
VOCs–	3-40 mL	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Comments
613 corrected cond umhos/cm.
MS/MSD Extra 6 40-mL HCl Vials
1 L HNO3
1 L NaOH
2 L Amber

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer Wi
Well Number: 7S
Previous Well Sampled: _____

Job No.: 84374xA
Tester: Dcm
Date Sampled: 3/13/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ Snow cover Damaged Missing: _____
Protector Pipe: OK Damaged Missing: _____
Well Cap: OK Damaged Missing: If Missing **Replaced?**
Temperature: _____ Clear/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: N/A Snow Cover (from Ground Surface)
Depth to Water: 20.16 (from TPVC)
Depth to Bottom: 24.05 (from TPVC)
Length of Water: 3.89
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Sampling Device: Disposable
Volume Required: 15 gallons
Volume Purged: 2.5 Water Level After: _____
Could Well Bail Dry? (yes) no

Purging – Time Start: 10:00 Time Ended: 10:20
Total Time Spent Purging: 20 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: B none
Color: Brown
pH: 5.12 @ 11.0 °C
Uncorrected Conductivity: 99 x 1
Water Temp. (from Cond.) 11.0
Comments Corrected Cond 190 umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3-40	HCl
Metals–	1-ℓ	HNO_3
Indicator Parameters		NONE 2-ℓ
Indicator Parameters		1-ℓ NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: 6D
Previous Well Sampled:

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/13/96

GENERAL CONDITIONS:

Surface Seal: ~~OK~~ N/A Snow cover Damaged Missing:
Protector Pipe: (OK) Damaged Missing:
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 40's (Clear) Cloudy/Rain

WELL DATA:

Measuring Device: mscope
Stick Up or Down: N/A Snow cover (from Ground Surface)
Depth to Water: 18.32 (from TPVC)
Depth to Bottom: 62.75 (from TPVC)
Length of Water: 44.43
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Bailer Sampling Device: Disposable Bailer
Volume Required: 25
Volume Purged: 25 Water Level After:
Could Well Bail Dry? yes (no)

Purging – Time Start: 8:30 Time Ended: 10:00
Total Time Spent Purging: 1.5 hr

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: @ °C
Uncorrected Conductivity: 28 x1
Water Temp. (from Cond.) 8.1
Comments 42 umhos/cm corrected cond

Samples Collected

	#/Size	Preservatives
VOCs-	3-40 ml	HCl
Metals-	1-l	HNO3
Indicator Parameters		NONE 2-l
Indicator Parameters		1-l NaOH

Fill out the entire f
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
RESIDENTAL WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer WI
Well Number: 2551 + MS/MSD
Previous Sampling Point:

Job No.: 843744A
Tester: DM
Date Sampled: 3/13/96

GENERAL CONDITIONS:

Sampling location (ie. tap, spigot): OUT Side TAP
Temperature: 50 (Clear/Cloudy/Rain)

SAMPLING:

Sampling Device: N/A
Volume Required:
5 min Purge

Samples Collected	#/Size	Preservatives
VOCs—	3-40 ml	HCl
Metals—	1-L	HNO3
Indicator Parameters		
Indicator Parameters		NONE 2-L

IN-SITU TESTING 20 Sp ST

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.60 @ 10.5 °C
Uncorrected Conductivity: 84 x 10
Liquid Temp. (from Cond.) 10.3
Comments
corrected cond 119

RW FB01 - 2.15p

Fill out the entire f[illegible]
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
RESIDENTAL WELL SAMPLING SHEET

Project Name: Spickler   Job No.: 84374 XA
Location: Spencer   Tester: DLM
Well Number: 2543 + Dupe   Date Sampled: 5/13/96
Previous Sampling Point: Out Side Tap

GENERAL CONDITIONS :

Sampling location (ie. tap, spigot): OUT Side TAP

Temperature: 40's   (Clear) / Cloudy / Rain

SAMPLING :

Sampling Device: N/A
Volume Required:

5 min purge

ST 1:40 | 1:45 Dupe

Samples Collected	#/Size	Preservatives
VOCs—	3 - 40 ml	HCl
Metals—	1 - l	HNO3
Indicator Parameters		2 - l NaOH
Indicator Parameters		NONE 2 - l none

IN-SITU TESTING

Tubidity: (clear) turbid opaque
Odor: no
Color: Clear
pH: °C.
Uncorrected Conductivity: 6.1 x .1
Liquid Temp. (from Cond.) 10.1
Comments

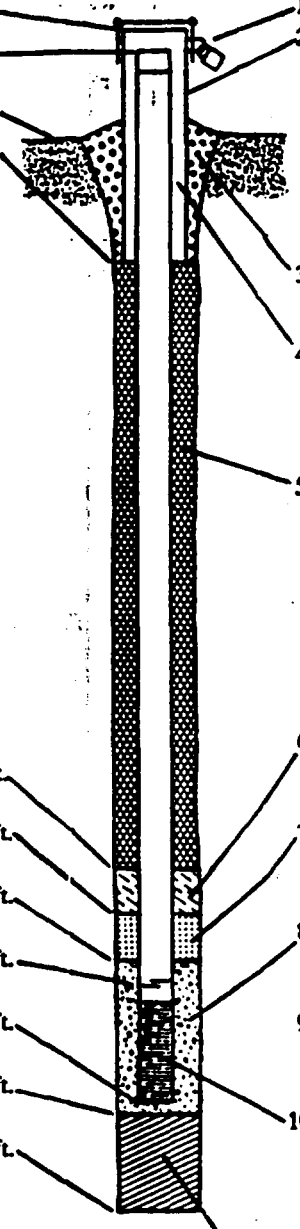
Corrected 87 Umhos/cm

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCT
Form 4400-113A Rev.

Facility/Project Name: SPICKLER LANDFILL	Local Grid Location of Well: ___ ft. ☐N ☐S ___ ft. ☐E ☐W	Well Name: SIAR
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. ___ Long. ___ or	Wis. Unique Well Number: DNR Well
Type of Well: Water Table Observation Well ☐ 11; Piezometer ☒ 12	St. Plane ___ ft. N, ___ ft. E.	Date Well Installed: 3/14/96 (m m d d y y)
Distance Well Is From Waste/Source Boundary: ___ ft.	Section Location of Waste/Source: ___1/4 of ___ 1/4 of Sec. ___, T. ___ N, R. ___ ☐E ☐W.	Well Installed By: (Person's Name and Firm): Glenn Davis / STS Consultants
Is Well A Point of Enforcement Std. Application? ☒ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	



A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation _____ ft. MSL
C. Land surface elevation _____ ft. MSL
D. Surface seal, bottom _____ ft. MSL or 4.0 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☒

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☐ 41; Other ☐ ___

15. Drilling fluid used: Water ☒ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis):
City of Marshfield

E. Bentonite seal, top _____ ft. MSL or 26.8 ft.
F. Fine sand, top _____ ft. MSL or 31.8 ft.
G. Filter pack, top _____ ft. MSL or 33.9 ft.
H. Screen joint, top _____ ft. MSL or 35.9 ft.
I. Well bottom _____ ft. MSL or 38.9 ft.
J. Filter pack, bottom _____ ft. MSL or 39.4 ft.
K. Borehole, bottom _____ ft. MSL or 39.4 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.05 in.

1. Cap and lock? ☒ Yes ☐
2. Protective cover pipe:
a. Inside diameter: 4.0
b. Length: 2.9
c. Material: Steel ☒; Other ☐ _____
d. Additional protection? ☐ Yes ☒
If yes, describe: _____
3. Surface seal: Bentonite ☒; Concrete ☐; Other ☐ _____
4. Material between well casing and protective pipe: Bentonite ☒; Annular space seal ☐; Other ☐ _____
5. Annular space seal: a. Granular Bentonite ☒ (Chipped)
b. _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐
c. _____ Lbs/gal mud weight ..... Bentonite slurry ☐
d. _____ % Bentonite ..... Bentonite-cement grout ☐
e. 7 Ft³ volume added for any of the above
f. How installed: 9 bags; Tremie ☐; Tremie pumped ☐; Gravity ☒
6. Bentonite seal: a. Bentonite granules ☐
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☐
c. _____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh si
a. Waupaca Sand Company 40/60
b. Volume added .3 ft³ ½ bag
8. Filter pack material: Manufacturer, product name and mesh
a. Waupaca Sand Company #30
b. Volume added .9 ft³ 2 bags
9. Well casing: Flush threaded PVC schedule 40 ☒; Flush threaded PVC schedule 80 ☐; Other ☐ _____
10. Screen material: PVC
a. Screen type: Factory cut ☒; Continuous slot ☐; Other ☐ _____
b. Manufacturer Timco
c. Slot size: 0.01
d. Slotted length: 3.
11. Backfill material (below filter pack): None ☒; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: George J. Bayer | Firm: STS Consultants

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. St and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more tha $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for eac day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

STS GEO-ENVIRONMENTAL GROUP
FIELD REPORT

		Job No.	84374xA
Project	Spickler LF	**Day**	Thurs
Location		**Date**	3/14/96
Client		**Weather**	40 Cloudy

Mileage	478 Total	**Arrive Job**	7:00	**Total Chargeable Hours**	10.75
Expenses		**Leave Job**	1:15		
		Travel Time	4.0 hr		
			.5 lab		

Summary of Technical and/or Engineering Services performed, including field test data, locations, elevations & estimated depths.

- Repacked Samples with Ice for Carrier Pickup.
- Checked leachate collection system operation. Lift Station #1 would not pump into collection Tank. Town & Country Electrician on site.
- located wells S1 & S1A and collected water levels.
- Dropped off extra equipment AT midstates.
  Returned to STS.

Field Test Data is Estimated Pending Final Laboratory Results.

5/94/qpro gray disk

By: D Maletz.
STS Consultants, Ltd.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
SPICKLER - LANDFILL		SIAR
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well Number**
_____	___	_____ / _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☒	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well ___65 min.

4. Depth of well (from top of well casisng) __41.9 ft.

5. Inside diameter of well __2.05 in.

6. Volume of water in filter pack and well casing ___2.1 gal.

7. Volume of water removed from well __21.5 gal.

8. Volume of water added (if any) ____._ gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 32.21 ft.	40.60 ft.
Date	b. 3/16/95 (m m d d y y)	3/16/95 (m m d d y y)
Time	c. 6:25 ☒ a.m. ☐ p.m.	3:15 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	1.0 inches	___._ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	light brown opaque	light gray cloudy
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	688.0 mg/l	95.0 mg/l
15. COD	61.5 mg/l	52.0 mg/l

16. Additional comments on development:

Borehole diameter 6"
3 feet stickup.

Well developed by: Person s Name and Firm

Name: George J Boyer

Firm: STS Consultants

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: George J Boyer

Print Initials: GJB

Firm: STS Consultants

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

STS GEO-ENVIRONMENTAL GROUP
FIELD REPORT

Job No. 8437-4xA

Project	Spickler LF	**Day**	Thurs
Location	Town of Spencer	**Date**	3/21/96
Client	Weyerhaeuser	**Weather**	30 clear

Mileage		**Arrive Job**	7:00	**Total Chargeable Hours**	12
Expenses		**Leave Job**	7:00		
		Travel Time	—		

Summary of Technical and/or Engineering Services performed, including field test data, locations, elevations & estimated depths.

Completed wells: S3, S3A, S3AR, S1, S1A, S1AR. Newly installed wells (S3AR & S1AR) were developed with a bailer by Surging and purging the well then removing 10 well volumes. TSS & COD Samples collected Before and After Development. Development forms Attached.

Well S2AR was Developed by removing 10 well volumes. The water Produced before and After was light Brown or Tan in color. Wells S-2 & S2A were Also producing Brown or Tan Sandy Water. Water used to core well 2AR is Assumed to have Affected wells S2 & S2A. All Three wells (S2, S2A & S2AR) were Sampled but were not sent to the lab. Additional Supplies to redevelope the wells have been sent From Mi:w office. Development Water Contained in leachate collection System.

Field Blank FB03 completed w/ Store bought Water, poured Through a new disposable Bailer & Treated as Samp.

ph, cond & Temp. Measured and recorded in Field logbook and on Field Sampling Sheets. Sample color odor & Turbidity was noted on field Sampling Sheets

Field Test Data is Estimated Pending Final Laboratory Results.

tgw/6/94/qpro gray ask

By: D. McK12.
STS Consultants, Ltd.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Spickler		S-2AR
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well Number**
_____	__	

	Before Development	After Development
1. Can this well be purged dry?	☐ Yes ☒ No	
2. Well development method		
surged with bailer and bailed ☒ 41		
surged with bailer and pumped ☐ 61		
surged with block and bailed ☐ 42		
surged with block and pumped ☐ 62		
surged with block, bailed and pumped ☐ 70		
compressed air ☐ 20		
bailed only ☐ 10		
pumped only ☐ 51		
pumped slowly ☐ 50		
Other _____ ☐		
11. Depth to Water (from top of well casing)	a. 18.99 ft.	22.00 ft.
Date	b. 03/21/96 (m m d d y y)	03/21/96 (m m d d y y)
Time	c. 11:00 ☐ a.m. ☐ p.m.	12:15 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	4.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☐ 25 (Describe)
3. Time spent developing well	75 min.	
4. Depth of well (from top of well casisng)	30.8 ft.	
5. Inside diameter of well	2.06 in.	
6. Volume of water in filter pack and well casing	4.0 gal.	
7. Volume of water removed from well	40.0 gal.	
8. Volume of water added (if any)	0.0 gal.	
9. Source of water added	N/A	
10. Analysis performed on water added? (If yes, attach results)	☒ Yes ☐ No	

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	DCM ~~19.1~~ 33.0 mg/l	33.0 mg/
15. COD	19.1 mg/l	5.0 mg/

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: Gene Erzar

Firm: STS - Minneapolis

I hereby certify that the above information is true and correct to the bes of my knowledge.

Signature: _____

Print Initials: ____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Spickler LF		S-3AR

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well Number
_____	___		

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☒ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well ___110 min.

4. Depth of well (from top of well casisng) ___32.7 ft.

5. Inside diameter of well ___2.06 in.

6. Volume of water in filter pack and well casing ___4.9 gal.

7. Volume of water removed from well ___50.0 gal.

8. Volume of water added (if any) ___0.0 gal.

9. Source of water added N/A

10. Analysis performed on water added? ☒ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 16.62 ft.	16.70 ft.
Date	b. 03/21/96 (m m d d y y)	03/21/96 (m m d d y y)
Time	c. 8:00 ☒ a.m. ☐ p.m.	9:50 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	8.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	878.0 mg/l	1348.0 mg/l
15. COD	19.4 mg/l	21.0 mg/l

16. Additional comments on development:

Well developed by: Person s Name and Firm

Name: Gene Erzar

Firm: STS - Minneapolis

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Print Initials: ____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: EB03
Previous Well Sampled: _____

Job No.: ~~843~~ 84374XA
Tester: DCM
Date Sampled: 3/21/96

GENERAL CONDITIONS: N/A

Surface Seal: OK Damaged Missing: _____
Protector Pipe: OK Damaged Missing: _____
Well Cap: OK Damaged Missing: If Missing **Replaced?**
Temperature: 30 Clear/Cloudy/Rain

WELL DATA:

Measuring Device: N/A
Stick Up or Down: _____ (from Ground Surface)
Depth to Water: _____ (from TPVC)
Depth to Bottom: _____ (from TPVC)
Length of Water: _____
Free Product Observed: yes/no Thickness: _____ (in bailer/by I-Probe)

PURGING/SAMPLING: N/A

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: _____ Sampling Device: _____
Volume Required: _____
Volume Purged: _____ Water Level After: _____
Could Well Bail Dry? yes no

Purging – Time Start: _____ Time Ended: _____
Total Time Spent Purging: _____

Decon Method: Cleaned in office/Field Decon Method: _____

IN-SITU TESTING:

Tubidity: clear turbid opaque
Odor: none
Color: clear
pH: 7.78 @ 2.6 °C
Uncorrected Conductivity: 2 x 1
Water Temp. (from Cond.) 3.6
Comments 4 corrected cond

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO_3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L non

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: SIAR
Previous Well Sampled: _____

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30 (Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: MScope
Stick Up or Down: + 3.0 (from Ground Surface)
Depth to Water: 37.54 (from TPVC)
Depth to Bottom: 41.79 (from TPVC)
Length of Water: _____
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Volume Required: _____
Volume Purged: 3.0 gallons
Could Well Bail Dry? (yes) no

Sampling Device: Disposable Bailer
Water Level After: _____

Purging – Time Start: 15:30 Time Ended: 16:20
Total Time Spent Purging: 50 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: organic
Color: light Grn
pH: 6.62 @ 7.5 °C
Uncorrected Conductivity: 211 x10
Water Temp. (from Cond.) 7.5
Comments 3246 umhos/cm

Samples Collected

	#/Size	Preservatives
VOCs-	3-40 ml	HCl
Metals-	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S1A +MS/MSD
Previous Well Sampled: _____

Job No.: 84374xA ~~84374xx~~
Tester: Dm
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30 (Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: mscope
Stick Up or Down: -.40 (from Ground Surface)
Depth to Water: ~~Dm 3rd~~ 34.25 (from TPVC)
Depth to Bottom: 49.25 (from TPVC)
Length of Water: 15
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disp Bailer Sampling Device: Disp Bailer
Volume Required: 20
Volume Purged: 20 Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 15:10 Time Ended: 15:40
Total Time Spent Purging: 30 min

Decon Method: Cleaned in office/Field Decon Method: Disposed

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.65 @ 7.4 °C
Uncorrected Conductivity: 81 x 10
Water Temp. (from Cond.) 7.3
Comments 1254 Corrected Cond

Samples Collected	#/Size	Preservatives
VOCs–	9-40 ml	HCl
Metals–	2-l	HNO_3
Indicator Parameters	NONE	4-l
Indicator Parameters		2-l NaOH

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S-1
Previous Well Sampled: _____

Job No.: 84374XA ~~84378XA~~
Tester: Dcm
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged ~~Missing~~: If Missing **Replaced?**
Temperature: 30
(Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: -.30 (from Ground Surface)
Depth to Water: 17.20 (from TPVC)
Depth to Bottom: 21.05 (from TPVC)
Length of Water: 3.85
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Sampling Device: Disposable
Volume Required: 12
Volume Purged: 1.0
Water Level After: _____
Could Well Bail Dry? (yes) no

Purging – Time Start: 15:00 Time Ended: 15:10
Total Time Spent Purging: 10 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.72 @ 6.0 °C
Uncorrected Conductivity: 191 x 1
Water Temp. (from Cond.) 6.1

Samples Collected

	#/Size	Preservatives
VOCs-	3-40 ml	Hcl
Metals-		
Indicator Parameters		NONE
Indicator Parameters		

Comments: 307 umhos/cm Corrected Cond

VOCs only

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S2
Previous Well Sampled: _____

Job No.: 843482A
Tester: DLM
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30 (Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: mScope
Stick Up or Down: -.40 (from Ground Surface)
Depth to Water: 5.76 (from TPVC)
Depth to Bottom: 12.05 (from TPVC)
Length of Water: 6.29
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Sampling Device: Disposable
Volume Required: 13 gallons
Volume Purged: 13 gallons
Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 12:30 Time Ended: 13:00
Total Time Spent Purging: 30 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: Brown/Tan
pH: 7.07 @ 5.6 °C
Uncorrected Conductivity: 230 x 1
Water Temp. (from Cond.) 5.8
Comments: Corrected cond 373

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters	NONE 2-L	
Indicator Parameters	1-L	NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S-2A
Previous Well Sampled: _____

Job No.: 84374-A
Tester: DCM
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing Replaced?
Temperature: 30
(Clear) Cloudy/Rain

WELL DATA:

Measuring Device: mScope
Stick Up or Down: -.40 (from Ground Surface)
Depth to Water: 16.14 (from TPVC)
Depth to Bottom: 23.59 (from TPVC)
Length of Water: 7.45
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Sampling Device: Disposable
Volume Required: 15 Gallons
Volume Purged: 20 gallons
Water Level After: _____
Could Well Bail Dry? ~~yes~~ (no)

Purging – Time Start: 12:30 Time Ended: 12:45
Total Time Spent Purging: 15 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: Brown/Tan
pH: 6.63 @ 8.3 °C
Uncorrected Conductivity: 292 x 1
Water Temp. (from Cond.) 8.3
Comments corrected cond 438

Samples Collected

	#/Size	Preservatives
VOCs-	3-40 ml	HCl
Metals-	1-L	HNO3
Indicator Parameters	NONE 2-L	
Indicator Parameters	1-L non	

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S-2AR
Previous Well Sampled:

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing:
Protector Pipe: (OK) Damaged Missing:
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30
(Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: 3.0 (from Ground Surface)
Depth to Water: 18.99 (from TPVC)
Depth to Bottom: 30.80 (from TPVC)
Length of Water: 11.81
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Sampling Device: Disposable
Volume Required: 23
Volume Purged: 23 Water Level After:
Could Well Bail Dry? yes (no)

Purging – Time Start: 12:00 Time Ended: 1:30
Total Time Spent Purging: 30 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: light Tan / Brown
pH: 6.86 @ 6.6 °C
Uncorrected Conductivity: 251 x 1
Water Temp. (from Cond.) 7.0

Samples Collected

	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters	NONE	2-L
Indicator Parameters	1-L	NaOH

Comments
Corrected cond 392 umhos/cm

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S-3
Previous Well Sampled: _____

Job No.: 84374 xA
Tester: Dm
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30 (Clear) Cloudy/Rain

WELL DATA:

Measuring Device: m Scope
Stick Up or Down: N/A (from Ground Surface)
Depth to Water: 15.78 (from TPVC)
Depth to Bottom: 20.32 (from TPVC)
Length of Water: 4.54
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Sampling Device: Disposable
Volume Required: 10 gallons
Volume Purged: 3 gallons
Water Level After: _____
Could Well Bail Dry? (yes) no

Purging – Time Start: 9:05
Time Ended: 9:10
Total Time Spent Purging: 5 min

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 6.09 @ 6.0 °C
Uncorrected Conductivity: 229 x 1
Water Temp. (from Cond.) 6.1
Comments 368 umhos/cm corrected cond

Samples Collected	#/Size	Preservatives
VOCs–	3- 40 ml	HCl
Metals–	1-ℓ	HNO3
Indicator Parameters		NONE 2-ℓ
Indicator Parameters		1-ℓ NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler LF
Location: Spencer
Well Number: S-3A + Dupe
Previous Well Sampled: _____

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/21/96

GENERAL CONDITIONS: Snow cover limited inspection

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30 (Clear) Cloudy/Rain

WELL DATA:

Measuring Device: mScope
Stick Up or Down: N/A (from Ground Surface)
Depth to Water: 17.80 (from TPVC)
Depth to Bottom: 33.90 (from TPVC)
Length of Water: 16.10
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable Bailer Sampling Device: Disposable
Volume Required: 30
Volume Purged: 30 Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 8:17 Time Ended: 8:54
Total Time Spent Purging: 38

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: clear
pH: 5.53 @ 8.4 °C
Uncorrected Conductivity: 339 x 1
Water Temp. (from Cond.) 8.0
Comments corrected cond 339 umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-ℓ	HNO3
Indicator Parameters		NONE 2-ℓ
Indicator Parameters		1-ℓ NaOH

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S-3AR
Previous Well Sampled: _____

Job No.: 84374 xA
Tester: DCM
Date Sampled: 3/21/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30
(Clear) / Cloudy/Rain

WELL DATA:

Measuring Device: mSCope
Stick Up or Down: _____ (from Ground Surface)
Depth to Water: _____ (from TPVC)
Depth to Bottom: _____ (from TPVC)
Length of Water: _____
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Sampling Device: Disposable
Volume Required: _____
Volume Purged: _____
Water Level After: _____
Could Well Bail Dry? yes no

Purging – Time Start: _____ Time Ended: _____
Total Time Spent Purging: _____

Decon Method: Cleaned in office/Field Decon Method: Disposable.

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: Brown
pH: 6.10 @ 6.3 °C
Uncorrected Conductivity: 279 x 1
Water Temp. (from Cond.) 6.1
Comments 449 umhos/cm corrected cond

Samples Collected	#/Size	Preservatives
VOCs–	3- 40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: 2AR
Previous Well Sampled: _____

Job No.: 84374xA
Tester: DLM
Date Sampled: 3/22/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 40 (Clear) Cloudy/Rain

WELL DATA:

Measuring Device: mSope
Stick Up or Down: +2.6 (from Ground Surface)
Depth to Water: 18.95 (from TPVC)
Depth to Bottom: 31.00 (from TPVC)
Length of Water: 12.05
Free Product Observed: yes/(no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Bailer
Volume Required: 16
Volume Purged: 45
Could Well Bail Dry? yes (no)

Sampling Device: Bailer
Water Level After: _____

Purging – Time Start: 8:00 Am Time Ended: 10:00 Am
Total Time Spent Purging: 2 hrs

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: none
Color: Clear
pH: 5.83 @ 8.3 °C
Uncorrected Conductivity: 199 x 1
Water Temp. (from Cond.) 8.1
Comments Corrected Cond 301 umhos/cm

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form.
If it does not apply
mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spencer
Well Number: S2
Previous Well Sampled: _____

Job No.: 84374.aa
Tester: DCM
Date Sampled: 3/22/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 40
(Clear) Cloudy/Rain

WELL DATA:

Measuring Device: mSope
Stick Up or Down: -.40 (from Ground Surface)
Depth to Water: _____ (from TPVC)
Depth to Bottom: _____ (from TPVC)
Length of Water: _____
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Disposable
Sampling Device: Disposable
Volume Required: _____
Volume Purged: _____
Water Level After: _____
Could Well Bail Dry? (yes) no Bails Dry

Purging – Time Start: 9:00 Am Time Ended: 11:30
Total Time Spent Purging: 2.5 hr

Decon Method: Cleaned in office/Field Decon Method: Disposable

IN-SITU TESTING:

Tubidity: (clear) turbid opaque
Odor: leachate? organic
Color: light Gray
pH: @ °C
Uncorrected Conductivity: 229 x 1
Water Temp. (from Cond.) 6.1
Comments 368 Corrected Cond

Samples Collected

	#/Size	Preservatives
VOCs–	3- 40 ml	HCl
Metals–	1-L	HNO3
Indicator Parameters		NONE 2-L
Indicator Parameters		1-L NaOH

Fill out the entire form. If it does not apply mark N/A

SPICKLER LANDFILL SITE
OBSERVATION WELL SAMPLING SHEET

Project Name: Spickler
Location: Spinea
Well Number: S-2A
Previous Well Sampled: _____

Job No.: 84374.A
Tester: DCM
Date Sampled: 3/22/96

GENERAL CONDITIONS:

Surface Seal: (OK) Damaged Missing: _____
Protector Pipe: (OK) Damaged Missing: _____
Well Cap: (OK) Damaged Missing: If Missing **Replaced?**
Temperature: 30-40 (Clear)/Cloudy/Rain

WELL DATA:

Measuring Device: M Scope
Stick Up or Down: -.40 (from Ground Surface)
Depth to Water: _____ (from TPVC)
Depth to Bottom: _____ (from TPVC)
Length of Water: _____
Free Product Observed: yes (no) Thickness: N/A (in bailer/by I-Probe)

PURGING/SAMPLING:

Well Purging Calculations: 4 Well Volumes: **[(length of water X 0.12)+0.06] X 29.9 For 2" well**
10 Well Volumes: **[(length of water X 0.12)+0.06] X 74.8 For 2" well**

Purging Device: Bailer/pump Sampling Device: Disp Bailer
Volume Required: _____
Volume Purged: 100 Bailer/100 pump Water Level After: _____
Could Well Bail Dry? yes (no)

Purging – Time Start: 8:55A Time Ended: 15:30p
Total Time Spent Purging: _____

Decon Method: Cleaned in office/Field Decon Method: Disp Bailer

IN-SITU TESTING:

Tubidity: clear (turbid) opaque
Odor: none
Color: Cloudy Grey
pH: 5.90 @ 7.9 °C
Uncorrected Conductivity: 281 x 1
Water Temp. (from Cond.) 8.0 ~~281~~ DCM
Comments 425 Corrected Cond

Samples Collected	#/Size	Preservatives
VOCs–	3-40 ml	HCl
Metals–	1-L	HNO_3
Indicator Parameters	NONE	2-L
Indicator Parameters	1-L	NaOH

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Spickler LF		S2AR
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well Number**
_____	__	

		Before Development	After Development
1. Can this well be purged dry?	☐ Yes ☒ No		
2. Well development method			
surged with bailer and bailed	■ 41		
surged with bailer and pumped	☐ 61		
surged with block and bailed	☐ 42		
surged with block and pumped	☐ 62		
surged with block, bailed and pumped	☐ 70		
compressed air	☐ 20		
bailed only	☐ 10		
pumped only	☐ 51		
pumped slowly	☐ 50		
Other _____	☐		
3. Time spent developing well	135 min.		
4. Depth of well (from top of well casisng)	31.0 ft.		
5. Inside diameter of well	2.06 in.		
6. Volume of water in filter pack and well casing	4.0 gal.		
7. Volume of water removed from well	45.0 gal.		
8. Volume of water added (if any)	0.0 gal.		
9. Source of water added	N/A		
10. Analysis performed on water added? (If yes, attach results)	■ Yes ☐ No		
11. Depth to Water (from top of well casing)	a.	18.95 ft.	18.94 ft.
Date	b.	03/22/96 (m m d d y y)	03/22/96 (m m d d y y)
Time	c.	7:45 ■ a.m. ☐ p.m.	10:00 ■ a.m. ☐ p.m.
12. Sediment in well bottom		0.0 inches	0.0 inches
13. Water clarity		Clear ☐ 10 Turbid ■ 15 (Describe) Turbid	Clear ■ 20 Turbid ☐ 25 (Describe) Clear
Fill in if drilling fluids were used and well is at solid waste facility:			
14. Total suspended solids		225.0 mg/l	33.0 mg/l
15. COD		19.1 mg/l	5.0 mg/l

16. Additional comments on development: 2.6' Stickup

8:00 - 8:30 Surge & Purge removed 15 gallons - Turbid
8:45 - 8:55 removed 10 gallons Turbid
9:20 - 9:30 removed 10 gallons. Becoming clear -
9:40 - 9:50 removed 10 gallons clear -

Well developed by: Person's Name and Firm

Name: Dave Maikeiz

Firm: STS Consultants

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: _____

Print Initials: _____

Firm: _____

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

STS GEO-ENVIRONMENTAL GROUP
FIELD REPORT

Job No. 84374xA

Project	Spickler	**Day**	Fri
Location	Spencer WI	**Date**	3/22/96
Client	Weyerhaeuser	**Weather**	40- Clear

Mileage		**Arrive Job**	7:30	**Total**	
Expenses		**Leave Job**	5:30	**Chargeable**	10
		Travel Time	—	**Hours**	

Summary of Technical and/or Engineering Services performed, including field test data, locations, elevations & estimated depths.

Redeveloped wells S2AR, S2A & S2. Well S2AR was Surged & Purged with a pvc Bailer. An additional 45 gallons were removed and Became clear. TSS & COD Samples collected before and After Development.

well S2A was Surged & purged with a disposable pvc Bailer. 100 gallons of water was removed but the water remained Silty and Tan in color A whale pump and disposable Tubing was used to pump well 2A until clear. Pump rate of 1.0 - 1.5 gpm for Approx 1 hr.

well S2 was purged dry Several Times Prior to Sampling.

Collected Samples From: all Three wells. 3-40 ml VOA vials, 2-L amber no pres, 1-L NaOH were collected. Additional Sample was collected and Filtered in to a 1-L w HNO3.

Ph, cond and Temp were measured and recorded on field Sampling sheet and in field log book. OBSvations of color odor & Turbidity were also recorded.

Samples Stored on Ice After collection.

Field Test Data is Estimated Pending Final Laboratory Results.

tgw/6/94/qpro gray disk

By: D. Waldo

STS Consultants, Ltd.

STS GEO-ENVIRONMENTAL GROUP
FIELD REPORT

STS

		Job No.	84374xA
Project	Spickler LF	**Day**	Sat
Location	Spencer WI	**Date**	3/23/96
Client	Waste	**Weather**	30's Cloudy
Mileage		**Arrive Job**	6:45
Expenses		**Leave Job**	12:30
		Travel Time	
		Total Chargeable Hours	5.75

Summary of Technical and/or Engineering Services performed, including field test data, locations, elevations & estimated depths.

Delivered Samples From Spickler LF, Collected 3/22/96 pm to HES in Madison.

Returned to STS.

Field Test Data is Estimated Pending Final Laboratory Results.

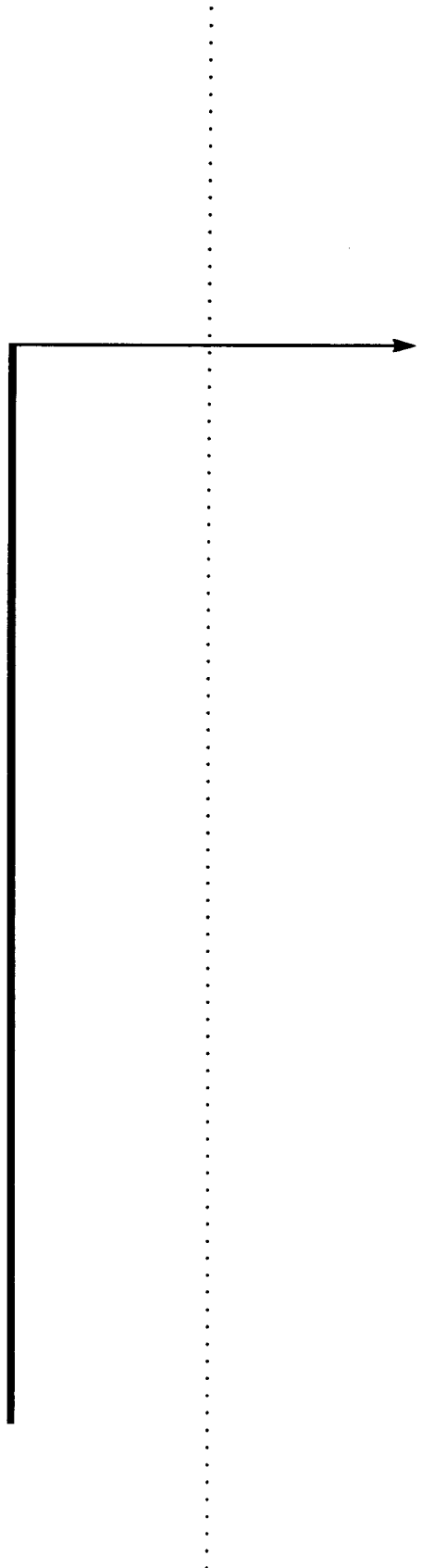
nw6/94/qpro gray osk

By: D. MARKS

STS Consultants, Ltd.

STS

B



APPENDIX B

Chain-of-Custody Forms

CHAIN OF CUSTODY RECORD

№ 26856

RECORD NUMBER 1 THROUGH 2

Contact Person: Jane Kahler
Phone No: (414) 359-3030 Office: Milwaukee
Project No: 84374xA PO No.:
Project Name: Spickler LF

Special Handling Request
- ☐ Rush
- ☐ Verbal
- ☐ Other

Laboratory: Hazelton
Contact Person: Matt Marks
Phone No.:
Condition: Cold Storage: WHR-2
Results Due: STD ACCT. #: 4892 Abbrev.: STSO

MS-R
COR-1

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data PID/FID Ambient	Field Data PID/FID Sample	Field Data PH	Field Data Special Cond.	Analysis Request	Comments (Include Major Contaminants)
SLRD-mw20S-0501	3/12	8:41	X		7	Water	X	X					low level Dup. VOC ~~8021~~, As, Ba, Cr, Mn, Fe, lead, Mercury, Napthalene, phthalates, Cyanide	
SLRD-mw14S-0501	3/12	9:40	X		7	Water	X	X						
SLRD-mw15S-0501	3/12	10:05	X		7	Water	X	X						
SLRD-mw13S-0501	3/12	11:35	X		7	Water	X	X						
SLRD-mw13S-0502	3/12	11:40	X		7	Water	X	X						
SLRD-mw13D-0501	3/12	12:00	X		7	Water	X	X						
SLRD-mw15D-0501	3/12	12:00	X		7	Water	X	X						
SLRD-mw6S-0501	3/12	15:22	X		7	Water	X	X						
SLRD-mw19D-0501	3/12	15:30	X		7	Water	X	X						

Smpl Rec'd MAR 14 1996 Init. LMD
Date Entered 3 14 96 LAD
LIMS # 6003004186-498

Collected by: David Mahler	Date 3/12/96	Time Am/pm	Delivery by: Dunham	Date 3/13/96	Time p.m
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Lynn Dorey	Date 3-14-96	Time 855	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition: Sample Time for 13D & 15D is 12:00
For Both (Sampled by two different Samplers)

Comments (Weather Conditions, Precautions, Hazards):
3-40 mL (HCl), 1-L Filt w/HNO3,
2-L Amb, 1-L NaOH
Rec'd with ice - LMD

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

STS Consultants Ltd.
Consulting Engineers

CHAIN OF CUSTODY RECORD

№ 26857

RECORD NUMBER 2 THROUGH 2

Contact Person Jane Kettler
Phone No. (414) 359-3030 Office milwaukee
Project No. 84374xA PO No.
Project Name Spickler LF

Special Handling Request
- ☐ Rush
- ☐ Verbal
- ☐ Other

Laboratory Matt Marks
Contact Person Hazelton
Phone No.
Results Due STD

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data PID/FID Ambient	Field Data PID/FID Sample	Field Data PH	Field Data Special Cond.	Analysis Request	Comments on Sample (Include Major Contaminants)
SLRD-MW19S-0511	3/12	15:15	X		7	Water	X						low level Dm VOC, ~~Met~~, As, Ba, Cr, Mn, Fe, lead,	
SLRD-MW19S-0599	3/12	15:20	X		7	Water	X						Mercury, Napthalene, phthalates, Cyanide	
SLRD-MWFB01-0501	3/12	16:00	X		7	Water	X							
~~SLRD-MW~~													low level Dm	
SLRD-MWTB01-0511					3	Water							VOC ~~DOC~~,	

Collected by: David Mckeil	Date 3/12/96	Time	Delivery by: Durham	Date 3/13/96	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Lynn Derry	Date 3-14-96	Time 855	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition:	Comments (Weather Conditions, Precautions, Hazards):
	Rec'd with ice - LMD

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

STS Consultants Ltd.

CHAIN OF CUSTODY RECORD

№ 26906

RECORD NUMBER 1 THROUGH 1

Contact Person June Kettler
Phone No. (414) 359-3030 Office Milwaukee
Project No. 84374xA PO No.
Project Name Spickler

Special Handling Request
- ☐ Rush
- ☐ Verbal
- ☐ Other

Laboratory Hazleton
Contact Person Matt Marks
Phone No.
Results Due STD

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data PID/FID Ambient	Field Data PID/FID Sample	Field Data PH	Field Data Special Cond.	Analysis Request	Comments on Sample (Include Major Contaminants)
SLRD-RW2543-0501	3/13	1:40	X		7	Water	X	X					low level VOCs, As, Ba, Cr, MN, Fe	
SLRD-RW2543-0519	3/13	1:45	X		7	Water	X	X					lead, Mercury, Napthalene, phthalates,	
SLRD-RW2551-0501	3/13	2:05	X		17	Water	X	X					Cyanide	
SLRD-RWFB01-0501	3/13	2:15	X		7	Water	X	X						
SLRD-RWTB01-0501					2	Water								

Condition Cold Storage WIR-2 WIR-1 MSK
Acct. # 4892 Abbrev. STSO LMD
Smpl Recd MAR 15 1996 Init. LMD
Date Entered 3-15-96
LIMS # 60300529 546

Collected by: David Mokl	Date 3/13/96	Time pm	Delivery by: Dunham	Date 3/14/96	Time AM
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Lynn Derry	Date 3-15-96	Time 915	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition: RW2551 MS/MSD

Comments (Weather Conditions, Precautions, Hazards): Rec'd with ice - LMD

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

CHAIN OF CUSTODY RECORD

№ 26602

RECORD NUMBER 1 THROUGH 1

Contact Person Jane Kettler
Phone No. (414) 259-3030 Office Milwaukee
Project No. 84374xA PO No.
Project Name Spickler LF

Special Handling Request
- ☐ Rush
- ☐ Verbal
- ☐ Other

Laboratory Huzelton
Contact Person Matt Marks
Phone No.
Results Due STD

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data PID/FID Ambient	Field Data PID/FID Sample	Field Data PH	Field Data Special Cond.	Analysis Request	Comments on Sample (Include Major Contaminants)
SLRD-MW11S-0501	3/13	8:47	X		7	Water	X	X					Low level VOC's, As, Ba, Mn, Fe, lead, mercury, Napthalene, phthalates, Cyanide	
*SLRD-MW6S-0501	3/13	10:03	X		7	Water	X	X						
SLRD-MW7S-0501	3/13	10:25	X		7	Water	X	X						
SLRD-MW10S-0501	3/13	9:55	X		17	Water	X	X						
SLRD-MW7D-0501	3/13	11:00	X		7	Water	X	X						
SLRD-MWFB02-0501	3/13	12:00	X		7	Water	X	X						
SLRD-MWTB02-0501					3	Water								

* Sample reads 6D - and 6S was acid 3-14-96 - LMD

Collected by: David Makarz	Date 3/13/96	Time	Delivery by: Dunham	Date 3/14/96	Time AM
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Lynn Derry	Date 3-15-96	Time 915	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition:	Comments (Weather Conditions, Precautions, Hazards):
MW10 MS/MS Dupe	Recd with ice - LMD

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

CHAIN OF CUSTODY RECORD

№ 29426

RECORD NUMBER 1 THROUGH 2

Contact Person Jane Kettler
Phone No. (414) 359-3032 Office Milwaukee
Project No. 84374xA PO No.
Project Name Spickler LF

Special Handling Request
- ☐ Rush
- ☐ Verbal
- ☐ Other

Laboratory HES
Contact Person Harley Cliff
Phone No.
Results Due 5 Condition Storage
Acct. # Abbrev.

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data: PID/FID Ambient	PID/FID Sample	PH	Special Cond.	Analysis Request
SLRD-S3A-0501	3/21	9:20	X		7	Water	X	X					Low level VOCs, As, Ba, Cr, Mn, Fe, lead, mercury, Naphthalene, phthalates, & cyanide
SLRD-S3A-0599	3/21	9:25	X		7	Water	X	X					
SLRD-S3-0501	3/21	9:35	X		7	Water	X	X					
SLRD-S3AR-0503	3/21	9:55	X		7	Water	X	X					
~~SLRD-S2AR-0503~~	~~3/21~~	~~12:30~~	~~X~~		~~7~~	~~Water~~	~~X~~	~~X~~					
~~SLRD-S2-0501~~	~~3/21~~	~~13:05~~	~~X~~		~~7~~	~~Water~~	~~X~~	~~X~~					DUP
~~SLRD-S2A-0501~~	~~3/21~~	~~12:45~~	~~X~~		~~7~~	~~Water~~	~~X~~	~~X~~					
SLRD-S1A-0501	3/21	15:55	X		17	Water	X	X					
SLRD-S1AR-0503	3/21	16:25	X		7	Water	X	X					

Smpl Rec'd MAR 23 1996 Init.
(Include Major Contaminants)
Date Entered
LIMS #

Condition Cold Storage GCR, WA-1
Acct. # 4882 Abbrev. STSO
WTS

Smpl Rec'd MAR 23 1996 Init. WTS
Date Entered 3-25-96
LIMS # 60300 76h

Collected by: David Metz	Date 3/21/96	Time AM/PM	Delivery by: Dunham	Date 3/22/96	Time AM
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Wilma Brouwer	Date 3/23/96	Time 10:10	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition:

Comments (Weather Conditions, Precautions, Hazards):
Rec'd on ice - good condition
Sample 53A-0599 - one bottle missing the A on label WTS

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

STS Consultants Ltd.

CHAIN OF CUSTODY RECORD

№ [illegible]128

RECORD NUMBER 2 THROUGH 2

Contact Person: Jane Kettler	Laboratory: HES
Phone No. (414) 359-3030 Office: Milwaukee	Contact Person: Harly Cliff
Project No. 84374 XA PO No.	Phone No.
Project Name: Spickler	Results Due: STD

Special Handling Request

- ☐ Rush
- ☐ Verbal
- ☐ Other

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data PID/FID Ambient	Field Data PID/FID Sample	PH	Special Cond.	Analysis Request	Comments on Sample (Include Major Contaminants)
														Condition Cold Storage W-2-1 Acct # 4892 Abbrev. STSO GAG
SLRD-S3AR-0501	3/21	8:05			2	Water	x	x					TSS + COD	Smp. Rec'd MAR 23 1996 Init
SLRD-S3AR-0502	3/21	9:50			2	Water	x	x					↓	
~~SLRD-S2AR-0501~~	~~3/21~~	~~10:55~~			~~2~~	~~Water~~	~~x~~	~~x~~	DCM				↓	Date Entered 3-25-96
~~SLRD-S2AR-0502~~	~~3/21~~	~~12:26~~			~~2~~	~~Water~~	~~x~~	~~x~~					↓	LIMS # 603007 66
SLRD-S1AR-0501	3/21	15:33			2	Water	x	x					↓	
SLRD-S1AR-0502	3/21	16:23			2	Water	x	x					↓	
SLRD-S1-0501	3/21	16:15			3	Water	x						low level VOC'S only	
SLRD MWTB 0501					2	Water	x						" " "	

Collected by: David Maki12	Date 3/21/96	Time Am/pm	Delivery by: Dunham	Date 3/22/96	Time pm
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Wilma Greenwell	Date 3/23/96	Time 10:10	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition:

Comments (Weather Conditions, Precautions, Hazards): Rec'd on Ice - Good condition
Sample S1AR-0502 - one bottle labeled S2AA - AG

Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

STS Consultants Ltd.

CHAIN OF CUSTODY RECORD

№ 29429

RECORD NUMBER 1 THROUGH 1

Contact Person Jane Kettler
Phone No (414) 359-3030 Office Milwaukee
Project No. 84374XA PO No.
Project Name Spickler LF

Special Handling Request
☐ Rush
☐ Verbal
☐ Other

Laboratory HES
Contact Person Harley Cliff
Phone No.
Results Due STD Condition Cold Storage GSA WR-1

Sample I.D.	Date	Time	Grab	Composite	No. of Containers	Sample Type (Water, soil, air, sludge, etc.)	Preservation Y	Preservation N	Field Data PID/FID Ambient	Field Data PID/FID Sample	Field Data PH	Field Data Special Cond.	Analysis Request
MW-S2AR-Before Development	3/22	8:00	X		2	Water	X	X					TSS + COD
MW-S2AR-After Development	3/22	10:00	X		2	Water	X	✓					TSS + COD
SLRD-S2AR-0501	3/22	14:45	X		7	Water	✓	X					low level VOCs, AS, Ba, CR, Mn, Fe
SLRD-S2-0501	3/22	15:10	X		7	Water	✓	✓					lead Mercury, Napthalene, phthalates,
SLRD-S2A-0501	3/22	15:45	X		7	Water							Cyanide
SLRD-MW FB03 0501													

Acct. # 4892 Abbrev. STSO
Comments on Sample (Include Major Contaminants) WJB
Smpl Rec'd MAR 23 1996 Init WJB
Date Entered 3-25-96
LIMS # 603 00 466

Collected by: David Maker	Date 3/22/96	Time Pm	Delivery by: D. Maker	Date 3/23/96	Time Am.
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received by:	Date	Time	Relinquished by:	Date	Time
Received for lab by: Lynn Derry	Date 3-23-96	Time 1010A	Relinquished by:	Date	Time

Laboratory Comments Only: Seals Intact Upon Receipt? ☐ Yes ☐ No ☐ N/A

Final Disposition:

Comments (Weather Conditions, Precautions, Hazards): Rec'd with ice - LMD

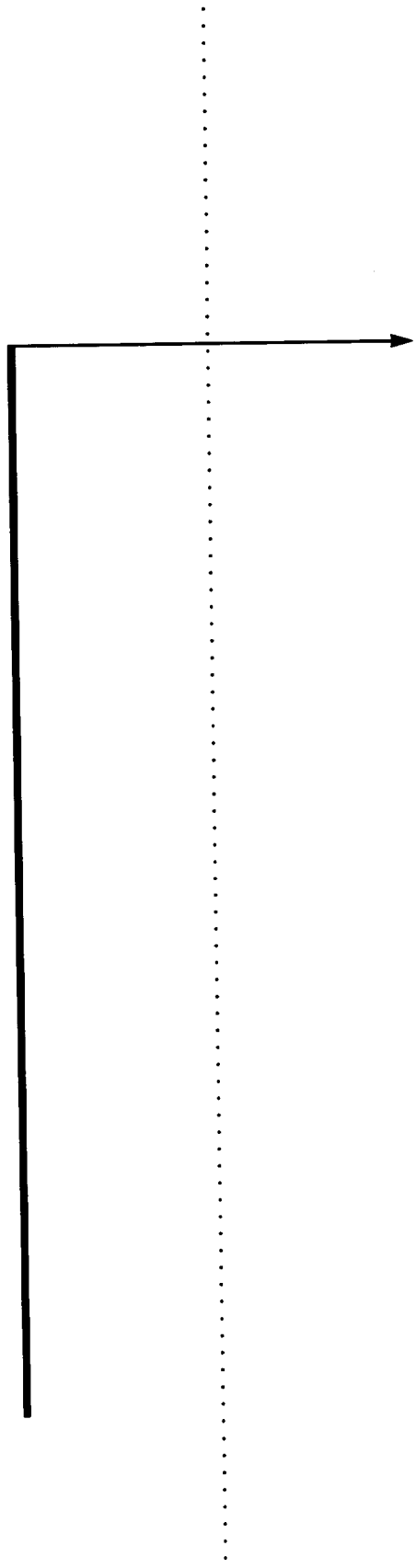
Distribution: Original and Green - Laboratory Yellow - As needed Pink - Transporter Goldenrod - STS Project File
Instructions to Laboratory: Forward completed original to STS with analytical results. Retain green copy.

9/94cp10k

STS Consultants Ltd.

STS

C



APPENDIX C

HES Case Narrative

Hazleton Environmental Services, Inc.
525 SCIENCE DRIVE MADISON, WISCONSIN 53711

May 6, 1996

Jane Kettler
STS Consultants, LTD
11425 West Lake Park Drive
Milwaukee, WI 53224

Dear Ms. Kettler:

Enclosed are the data packages presenting the volatile organic analysis of 17 water samples plus QC, also included is the semivolatile and inorganic analysis of 14 water samples plus QC. Also enclosed are spreadsheets presenting the Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS) results of six water samples. The samples were received on March 15 and 23, 1996 from the Spickler Landfill project. These Sample Delivery Groups (SDG) are designated as: SPK1Q2 and SPK1Q3.

LOW LEVEL VOLATILE ORGANIC ANALYSIS (Low Level 10/92 Contract)

- Holding Times. All samples were analyzed within the holding time of ten days from sample receipt.
- Method Blanks. The method blanks analyzed with the samples were within QC specifications.
- GC/MS Tuning. The samples were run under BFB tunes which met all QC criteria.
- Instrumental Calibrations. The initial and continuing calibrations were within QC criteria.
- System Monitoring Compounds (SMCs). All surrogate recoveries were found to be within QC criteria.
- Matrix Spike/Matrix Spike Duplicate. A matrix spike/matrix spike duplicate (MS/MSD) were analyzed for both SDGs. Sample MW10S0501 was designated as the parent sample in SDG SPK1Q2, while sample S1A0501 was designated as the parent sample in SDG SPK1Q3. The CLP SOW spiking compounds were added to the MS/MSDs. The recoveries ranged from 93% to 109% for SDG SPK1Q2, while the recoveries ranged from 101% to 161% for SDG SPK1Q3.

- Laboratory Control Sample. The laboratory control samples (LCS) met all QC criteria with the following exceptions:

  SDG SPK1Q2: The LCSs performed on 3/18/96, 3/28/96, and 3/29/96 had the compound vinyl chloride above the upper QC limit of 140% (158%, 146%, and 166%, respectively).

  SDG SPK1Q3: The LCS performed on 3/29/96 had the compound vinyl chloride (166%) above the upper QC limit of 140%.

- Internal Standard Recoveries. All internal standard recoveries were found to be within QC criteria with the following exceptions:

  SDG SPK1Q3: The internal standard 1,4-dichlorobenzene-d4 fell below the lower QC limit for samples S1A0501DL, S1A0501MS, S1A0501MSD, and S1AR0503DL. The original analyses for the dilutions met QC criteria, but were being reanalyzed due to compounds exceeding the calibration range of the instrument.

- Dilutions.

  SDG SPK1Q2: Sample S30501 had total xylenes exceeding the calibration range of the instrument. This is denoted by the use of an 'E' flag on the Form 1. The sample was reanalyzed at a dilution. Both analyses are submitted in the data package.

  SDG SPK1Q3: Samples S1A0501 and S1AR0503 each had compounds exceeding the calibration range of the instrument. This is denoted by the use of an 'E' flag on the Form I. Each sample was reanalyzed at a dilution. Both analyses are submitted in each case.

- Data Qualifiers. An 'X' flag was used on many Form Is to denote that a manual quantitation was performed.

SEMIVOLATILE ORGANIC ANALYSIS

- Holding Times. All samples were extracted and analyzed within the holding time specified in the CLP SOW, with the following exception:

  SDG SPK1Q3: Sample MW13S-0599, from SDG SPK1Q1, required re-extraction due to noncompliant surrogates. The sample was re-extracted outside the holding time and is submitted with this SDG.

- Method Blanks. The method blanks extracted and analyzed with the samples were within QC specifications.

- o GC/MS Tuning. The samples were run under DFTPP tunes which met all QC criteria.

- o Instrumental Calibrations. The initial and continuing calibrations were within QC criteria.

- o Surrogate Recoveries. All surrogate recoveries were found to be within QC criteria.

- o Matrix Spike/Matrix Spike Duplicate. A matrix spike/matrix spike duplicate (MS/MSD) were analyzed for both SDGs. Sample MW10S-0501 was designated as the parent sample for SDG SPK1Q2, while sample S1A-0501 was designated as the parent sample for SDG SPK1Q3. The compounds of concern were added to the MS/MSD. The recoveries ranged from 41% to 97% for SDG SPK1Q2, while the recoveries ranged from 83% to 165% for SDG SPK1Q3.

- o Internal Standard Recoveries. All internal standard recoveries were found to be within QC criteria.

INORGANIC ANALYSIS

- o Initial and Continuing Calibration Verification. All calibration verification standards were within QC specifications.

- o Method Blanks. All method blanks were within QC specifications.

- o ICP Interference Check. All ICP interference check samples were within QC specifications.

- o Spike Recovery. All matrix spike recoveries were within QC specifications.

- o Duplicate Analysis. All RPD values for the duplicate analysis were found to be within QC specifications.

- o Laboratory Control. All laboratory control results were within QC specifications.

- o Method of Standard Additions (MSA). The MSA was not required for these analyses.

- o ICP Serial Dilution. All percent differences (%D) for the serial dilution were within QC specifications with the following exception:

SDG SPK1Q3: The percent difference (%D) for iron (18.6%) exceeded the QC criteria. The Forms 1 and 9 are appropriately 'E' flagged. This represents the possibility of a matrix interference on the determination of this element.

o Analyses Comments.

SDG SPK1Q2: Two lead results were 'W' flagged, indicating that the post-digestion (analytical) spike was recovered outside the 85%-115% range, while the sample absorbance was less than 50% of the spike absorbance.

Please contact either Harley Cliff or Amy Austin if you have any questions regarding the data or require further assistance at (608) 232-3300.

Sincerely,

Amy L. Austin
Supervisor
Quality Assurance

Harley G. Cliff
Supervisor
Mass Spectrometry

cc: Central file
Case file

Hazleton
Environmental
Services, Inc.

525 SCIENCE DRIVE MADISON, WISCONSIN 53711

HES, Inc.

April 24, 1996

Jane Kettler
STS Consultants, LTD
11425 West Lake Park Drive
Milwaukee, WI 53224

Dear Ms. Kettler:

Enclosed are the data packages presenting the volatile organic analysis of 20 water samples plus QC, also included is the semivolatile and inorganic analysis of 18 water samples plus QC. The samples were received on March 14 and 15, 1996 from the Spickler Landfill project. This Sample Delivery Group (SDG) is designated as: SPK1Q1. The remaining results will be sent upon completion.

LOW LEVEL VOLATILE ORGANIC ANALYSIS (Low Level 10/92 Contract)

- Holding Times. All samples were analyzed within the holding time of ten days from sample receipt.
- Method Blanks. The method blanks analyzed with the samples were within QC specifications.
- GC/MS Tuning. The samples were run under BFB tunes which met all QC criteria.
- Instrumental Calibrations. The initial and continuing calibrations were within QC criteria.
- System Monitoring Compounds (SMCs). All surrogate recoveries were found to be within QC criteria.
- Matrix Spike/Matrix Spike Duplicate. A matrix spike/matrix spike duplicate (MS/MSD) were analyzed for sample RW2551-0501. The CLP SOW spiking compounds were added to the MS/MSD. The recoveries ranged from 96% to 146%.
- Laboratory Control Sample. The laboratory control samples (LCS) met all QC criteria with the following exceptions:

The LCS performed on 3/15/96 and 3/18/96 had the compound vinyl chloride above the upper QC limit of 140% (152% and 158%, respectively).

- Internal Standard Recoveries. All internal standard recoveries were found to be within QC criteria.

- Dilutions. Samples MW13S0501 and MW13S0599 each had total xylenes exceeding the calibration range of the instrument. This is denoted by the use of an 'E' flag on the Form I. Each sample was reanalyzed at a dilution. Both analyses are submitted in each case.

- Data Qualifiers. An 'X' flag was used on many Form Is to denote that a manual quantitation was performed.

SEMIVOLATILE ORGANIC ANALYSIS

- Holding Times. All samples were extracted and analyzed within the holding time specified in the CLP SOW.

- Method Blanks. The method blanks extracted and analyzed with the samples were within QC specifications.

- GC/MS Tuning. The samples were run under DFTPP tunes which met all QC criteria.

- Instrumental Calibrations. The initial and continuing calibrations were within QC criteria.

- Surrogate Recoveries. All surrogate recoveries were found to be within QC criteria with the following exception:

  Sample MW13S-0599 had all surrogate recoveries fall below their lower QC limits. The sample is in the process of being re-extracted. The re-extraction will be sent with the remainder of the data. Please see the attached Nonconformance /Corrective Action Report, #433.

- Matrix Spike/Matrix Spike Duplicate. A matrix spike/matrix spike duplicate (MS/MSD) were analyzed for sample RW2551 0501. The compounds of concern were added to the MS/MSD. The recoveries ranged from 92% to 102%.

- Internal Standard Recoveries. All internal standard recoveries were found to be within QC criteria.

INORGANIC ANALYSIS

- Initial and Continuing Calibration Verification. All calibration verification standards were within QC specifications.
- Method Blanks. All method blanks were within QC specifications.
- ICP Interference Check. All ICP interference check samples were within QC specifications.
- Spike Recovery. All matrix spike recoveries were within QC specifications.
- Duplicate Analysis. All RPD values for the duplicate analysis were found to be within QC specifications.
- Laboratory Control. All laboratory control results were within QC specifications.
- Method of Standard Additions (MSA). The MSA was not required for these analyses.
- ICP Serial Dilution. All percent differences (%D) for the serial dilution were within QC specifications.

Please contact either Harley Cliff or Amy Austin if you have any questions regarding the data or require further assistance at (608) 232-3300.

Sincerely,

Amy L Austin

Amy L. Austin
Supervisor
Quality Assurance

cc: Central file
Case file
Harley Cliff

Document # 428

HES, Inc.
Nonconformance/Corrective Action Report

DIRECTIONS: Fill in the blanks and check appropriate boxes. Describe the nonconformance. For distribution, follow the flowchart in SOP OP-GEN.35.

1

Client: STS

Submitted By: Jane Schneider

LIMS Number(s) affected: 603a490

Assay Mnemonic: HZWS

Date Of Occurrence: 4/18/96

Date Initiated: 4/19/96

2 Describe Nonconformance (Problem):

All surrogate recoveries outside QC limits low

Why Did the Problem Occur: Not sure; chromatogram looks reasonably clean, so wouldn't think matrix interference (all internal stds fine).

Signature: Jane Schneider

3 CORRECTIVE ACTION REQUIRED? ____YES (fill out back of form) ____ NO

4 Supervisor Comments:

reextract, reanalyze. Data will be included with a later SDG.

Signature: K. Clay Date: 4-22-96

5 Project Manager Comments: (If Applicable) ____ Client Notified _____ (Date)

Signature: Date:

Corrective Action
(Side 2)

rective action is required, complete this side of the form also. See other side for details of nonconformance.

P 1: Analyst/Supervisor: State what needs to be done to correct nonconformance and prevent reoccurrence.

Signature: Date:

CORRECTIVE ACTION TAKEN

Corrective Action will be (has been) completed on: _____
Signature: Date:

STEP 2: QA Manager Review. Date Received in QAU: 4/24/96

Corrective Action Acceptable √ Yes ____ NO
QA Comments:

Reviewed by: Amy Austin Date: 4/24/96

QA FOLLOW-UP REPORT (If Applicable)
QA Comments:

Signature: Date:

more space is needed.